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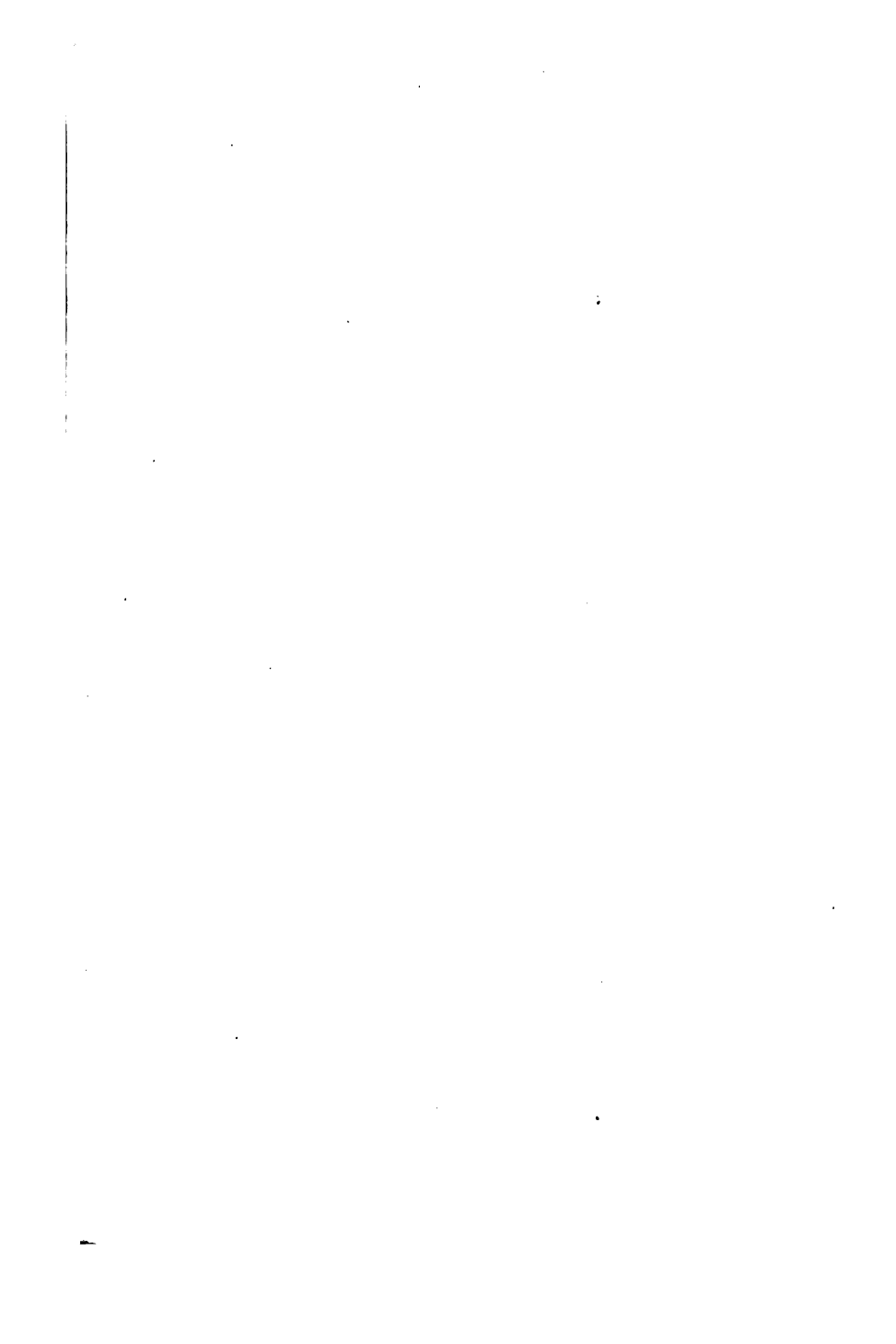
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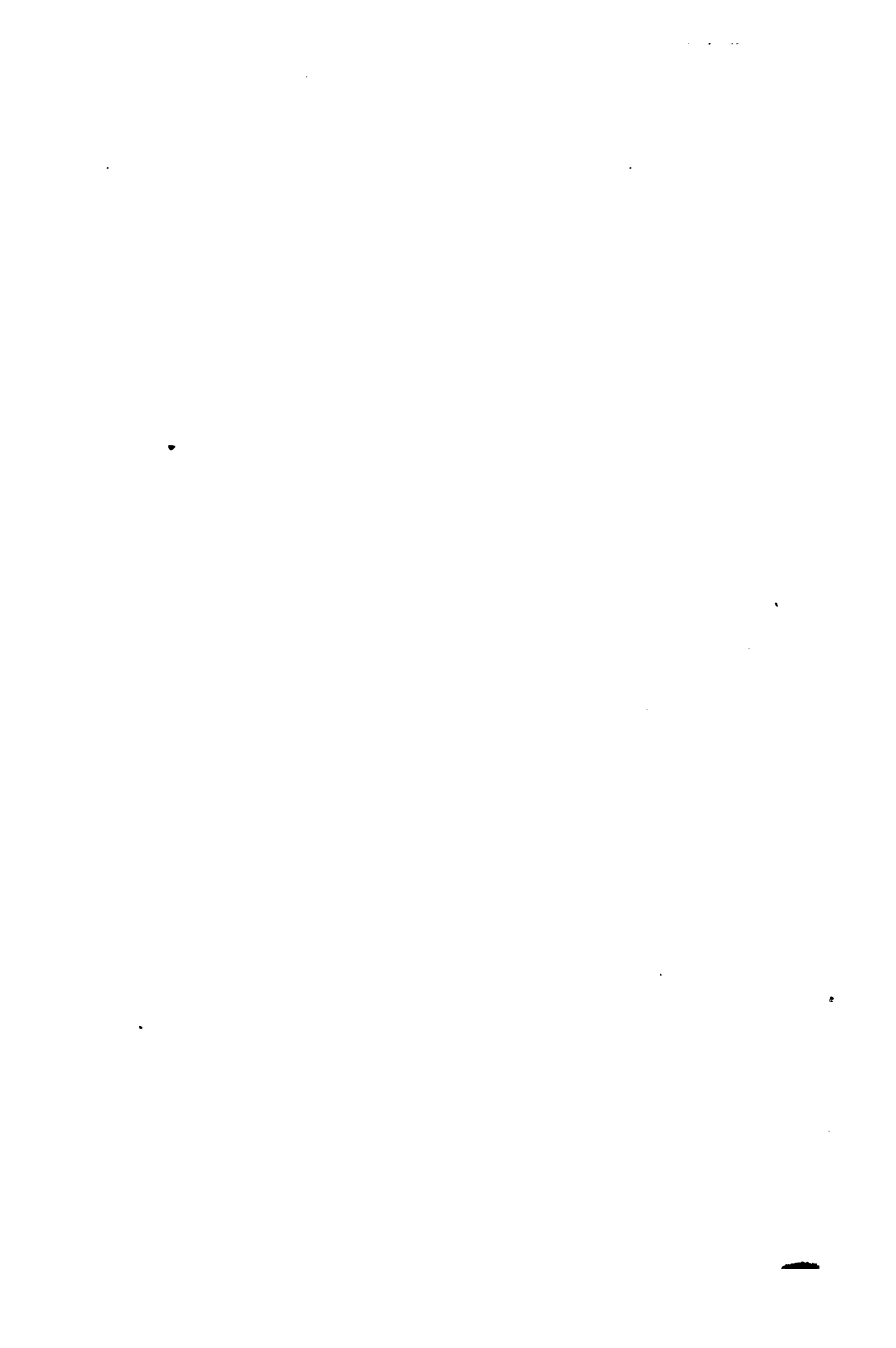
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THE
STORY OF AGRICULTURE
IN THE UNITED STATES

BY
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PREFACE

Those who are acquainted with the present state of historical investigation in this country know well that the great field of agricultural history has been by no means thoroughly explored. Consequently, a complete history of agriculture in the United States is not yet within the range of possibility.

In this book, the author has hoped merely to gather, as far as they are now available, the more important facts of our agricultural history, and to enliven the account with interesting details and descriptions. The idea that a history such as this should be accessible to those whose lives are associated with the occupation of agriculture is the result, in part, of the author's interest in the present-day movement for rural betterment; it follows logically, also, from the acceptance of the educational doctrine that much of the material for the instruction of young people should be drawn from their environment.

While the book is intended primarily for boys and girls who live on farms, the author hopes that it will be of interest to others, many of whom may have had experiences similar to those here recorded. Its best purposes will be fulfilled if the reading of the book makes the study of American history more vital and significant, if it adds dignity to the life and work of the farm, and if it helps to furnish a mental background upon which the routine of daily duties will appear more pleasant and the possibilities of rural improvement more real.

The author is especially indebted to Professor W. J. Trimble, of the North Dakota Agricultural College, through whose historical skill and practical knowledge of agriculture many errors

have been avoided; and to Professor C. R. Rounds, of the Milwaukee State Normal School, whose kindly criticism has wrought improvement in both the form and the substance of the chapters. Thanks are also due to other friends who read parts of the manuscript and contributed suggestions; among them are Professors E. L. Bogart and John G. Thompson, of the University of Illinois; O. M. Dickerson, of the Winona Normal School; and H. N. Sherwood, of the LaCrosse Normal School. Mrs. T. O. Douglas contributed valuable details for the accounts found on pages 153-158 and 275-277. Encouragement and suggestions have come from still others, including the publishers, whose assistance is hereby gratefully acknowledged.

Numerous maps and illustrations have been obtained through the courtesy of the State Historical Society of Wisconsin, the Department of Agriculture, Washington, D.C., the Wisconsin Agricultural Experiment Station, The International Harvester Company, and The LaCrosse Plow Company. For the plan of buildings at Mt. Vernon (p. 85) credit is due *The Century Magazine*.

ALBERT H. SANFORD.

LACROSSE, WISCONSIN,
December, 1915

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THE STORY OF AGRICULTURE IN THE UNITED STATES

CHAPTER I

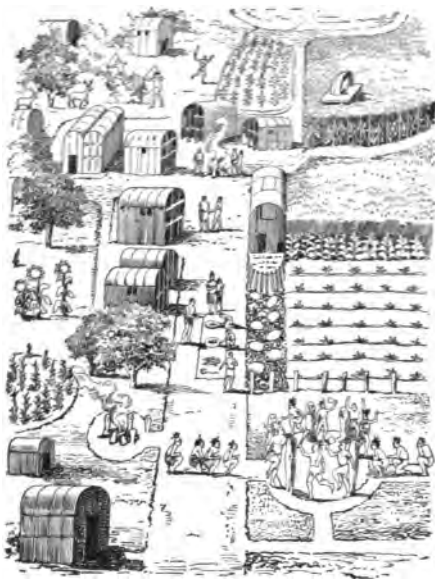
THE INDIANS AS FARMERS

THE first farmers in America were the Indians. The tribes that were found upon the Atlantic coast by the earliest explorers and settlers depended largely upon agriculture for their living. While they frequently separated into bands and left their villages to go upon hunting excursions, they returned and planted their crops regularly in the springtime. Besides game and fish and the crops from their fields and gardens, they obtained much food from the wild nuts, fruits, and roots that grew abundantly in the forests.

De Soto saw the cornfields of the southern Indians. Cartier and Champlain found the tribes on the St. Lawrence River planting corn. Henry Hudson said that while on the Hudson River he "saw a house well constructed of oak bark and a great quantity of maize or Indian corn and beans of last year's growth, and there lay near the house for the purpose of drying, enough to load three ships, besides what was growing in the fields."

It will be remembered that some of the first Englishmen who tried to settle in America were sent out by Sir Walter Raleigh. One of the leaders of their unsuccessful colony on Roanoke Island said that the Indian King

"sent us divers kinds of fruites. Melons, Walnuts, Cucumbers, Gourdes, Pease, and divers rootes, and fruits very



AN INDIAN VILLAGE

This picture occurs in *The new found land of Virginia* by Thomas Hariot, who was a member of the party sent out by Raleigh in 1585. They attempted to settle upon Roanoke Island.

excellent good, and of their country corne, which is very white, faire, and well tasted, and groweth three times in five moneths: in May they sow, in July they reape; in June they sow, in August they reape; in July they sow, in September they reape: onely they cast the corne into the ground, breaking a little of the soft turfe with a wooden mattock, or pickaxe: . . . they also have Beanes very faire of divers colors and

wonderful plentie: some growing naturally, and some in their gardens."

When the Pilgrims were searching for a good place to build their homes, they found on Cape Cod mounds in which the Indians had buried their corn for future use. This they took and afterward paid for; it helped them to live through that first terrible winter. Later, Squanto, the good Indian friend of the Plymouth settlers, showed

them how to plant corn and advised them to put into each hill a fish as fertilizer.

The settlers at Jamestown in Virginia were saved from starvation by the Indian corn that John Smith bought — at one time seven hogsheads and later several hundred bushels. It was through the wisdom of John Smith, who learned from the Indians their method of raising corn and who compelled the settlers to cultivate it, that Jamestown became our first permanent settlement.



FLINT SPADES AND HOE

One may well ask, how could the Indians raise their crops of corn by the hundreds and thousands of bushels, besides great quantities of beans, peas, squashes, pumpkins, melons, tobacco, and gourds, without any of the iron and steel implements that our farmers use? Instead of the iron hoe, a flat stone was chipped to the proper shape and fastened to a handle by means of thongs or withes. A broad shell, or the shoulder blade or antler of a deer, might be used as the blade of this crude hoe. Sometimes a sapling was found that had a strong root standing out at right angles to the stem; the trunk was used as a handle and the root was shaped like a pick or hoe and perhaps hardened in the fire.

The English settlers found that the Indians generally selected the richest soil for their fields. When it was necessary to clear the ground, they first pulled out the underbrush and then girdled the trunks of the trees near

the ground; that is, with their stone hatchets they hacked a belt around each tree through the bark and sapwood. This killed the trees; the leaves withered and let the sunlight through. Later, the dead trees and stumps were burned.

In the spring the dry weeds of the fields were gathered into piles and burned; then with their rude hoes the Indians dug shallow holes, three or four feet apart, into



A STONE HATCHET TIED ON WITH THONGS

each of which they dropped a few kernels of corn and a few beans. There were several varieties of corn, including the flint, sweet, and popcorn. Sometimes the seed was soaked before being planted. As the corn grew, it was hilled up, and the same hills might be used many years in succession. Between the corn hills the seeds of pumpkins, squashes, and peas were planted. When the corn ripened, the hungry flocks of wild birds became so troublesome that Indian boys and girls were stationed on platforms in the middle of the fields to frighten them away. Even then the corn frequently had to be picked before it was ripe. At harvest time the Indians gathered the ears in hand baskets and carried these to larger baskets, in which the corn was taken to the villages. When

husking time came, among some of the tribes there were jolly husking bees, and anyone who found a red ear received two from each husker of the company.

The Indians had many ways of cooking corn and also of keeping it for future use. Much of it was parched for use in winter or to be carried for food on their hunting trips. The Indian method of drying corn was to spread it out on mats in the sun, covering it at night; or, to place it upon a low platform under which a slow fire was kept burning. Often the husks were merely turned back and braided together, and the strings of ears were then hung up to dry. Corn was stored by being put into a pit lined with reeds, mats, or bark. Or, a cave might be dug in the hillside where the ears would be carefully laid in layers with dried grass between. Some of the southern Indians built corncribs of small logs, raised from the ground and plastered inside with mud.

The Indians were very fond of roasting corn on the cob. To do this they first dug a shallow trench and extended a long pole slightly above it, then leaned the ears against this pole over a fire in the trench. They had several ways of cooking green corn that was cut from the cob. It was sometimes mashed to a paste in a wooden mortar made by hollowing out the end of a stump or a block of wood. Cakes of this soft corn would then be wrapped in leaves and put into water that was made to boil by

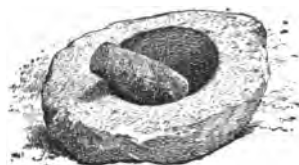


INDIAN BOILING POT

placing hot stones in it. The water was held in large pots made from clay mixed with crushed shells and then burned in fire until hard. The corn cakes were eaten with oil made from the seeds of sunflowers, or with bear's grease.

When hominy was made, the kernels were first soaked in lye made from wood ashes, as a means of loosening the hulls. The mass was then placed in a basket and soused in water to get rid of the hulls, which would float on the surface and could then be removed. If the hominy was pressed through a basket sieve, the result was a kind of meal, which could be dried. Later, this meal could be made into cakes and be either fried or boiled.

Hard corn was cracked in a wooden or stone mortar and ground upon a stone that had a hollowed surface.



STONE MORTAR FOR POUNDING
GRAIN

It could then be sifted and the larger particles pounded or ground again. Beans and peas were boiled with the corn to make "succotash." Squashes and pumpkins were boiled in earthen vessels, or baked under the embers of a fire or in

a clay pit which had been made hot by a fire that was afterwards removed. These vegetables were often cut into rings and hung up to dry over a fire.

The North American Indians did not cultivate the white potato. This was brought into the colonies from England, after having come originally from South America. The sweet potato was an important food crop among the southern Indians, however, and from them the whites learned to cultivate it.

It is not certain that each Indian family owned its own field. Usually the cultivated lands were owned by the clan or tribe living in a village; but a certain tract was assigned to each family for cultivation. In Virginia each family also had a garden near its wigwam. It was common for the Indians to work their fields together, each helping to cultivate the others' crops. Tobacco was an important Indian crop, and in most tribes it was cultivated by the men and was usually smoked by them only. It was used in connection with religious ceremonies.

Among the Indians the principal work in the fields was done by the women, but it should not be understood that the women did more than a fair share of all the work, or that they were slaves and drudges to the men. Hunting and fishing, the work of the men, were not sports, but serious and difficult tasks. Besides, the canoes, bows, arrows, and stone weapons and implements were made by the men; this required much time, skill, and patience. Then, with most tribes, wars were frequent and kept the men busy. Where there was less war, the men worked in the fields with the women. In addition, it was the duty of the men to spend much time in learning and conducting all the ceremonies of Indian government and religion. This was no small task, and took much of their time and strength. The squaws were aided in their farm work by the old men and the children. This occupied but a few weeks in the summer. But since the women also prepared the food and clothing, theirs was a busy life.

The most intelligent Indians of the Atlantic coast were the Iroquois, who lived in what is now Central New York State. Here there were large towns surrounded by palisades. The fields of a town were sometimes one hundred

8 AGRICULTURE IN THE UNITED STATES

or more acres in extent, and there were orchards of apple, plum, and pear trees besides. During the French and Indian Wars and the Revolutionary War, the white men's armies more than once invaded this country; and it is reported that one expedition destroyed 160,000 bushels of corn.

The Indians of the Mississippi valley, no less than those of the Atlantic coast, were farmers, sometimes on a



large scale. Agriculture was naturally more important in the South than in the North. Where the buffalo was more common, agriculture was less depended upon as a source of food. In the dry regions of the great plains and in the Rocky Mountains there were some tribes that carried on little or no agriculture, but considerable corn was raised by tribes living along the Missouri River.

In the region now called New Mexico and Arizona the Indians carried on agriculture by means of irrigation. They had reservoirs and many miles of ditches. These were in some cases cut out of solid rock; and in one sandy

region they were made seven feet deep and lined with clay to hold the water better. It is thought that in the Salt River Valley of Arizona 250,000 acres were irrigated. Here were raised vast quantities of corn, sunflowers, cactus, yucca, mesquite beans, and agave.

Among the Pacific Coast Indians there was little or no agriculture. They lived upon sea products (fish, clams, sea-grass, etc.), the abundant wild fruits, nuts, acorns, and grains, besides wild beasts and fowls. The early missionaries, instead of learning from these Indians as the early settlers of the Atlantic coast had done, found it necessary to teach them how to cultivate fields and to raise crops.

Among some of the Indian tribes who lived about the Great Lakes, wild rice was the chief source of food. This plant grows in the shallow waters of streams, lakes, and swamps, and a great field was usually divided among the families of a tribe. Before the grain was ripe, the women went through it with their canoes, twisting and tying the growing stalks into bunches. This prevented the wind from blowing the ripened kernels into the water and made it more difficult for the birds to get at them.

To harvest the grain two women went out in a canoe, one sitting in each end. One had a forked stick which she thrust down into the mud, and this guided and steadied the canoe. The other carried two sticks; one had a crook at the end, with which she bent the bundles of rice over the canoe; with the other she beat out the kernels until her end of the canoe was comfortably filled. The women then exchanged sticks and tasks, and so the other end of the canoe would be filled. To hull the rice, a few quarts were poured into a skin bag; this was placed

in a shallow hole in the ground and trodden upon. It was winnowed by being tossed up in the air when a breeze was blowing; or, a birchbark fan was used to blow the husks away. The rice was dried or parched by sun or fire, and was thus kept for winter use.

The Indian's agriculture was closely connected with his religion. A religious festival was held at planting



INDIAN WOMEN GATHERING RICE
After Schoolcraft.

time, with prayers to Mother Earth for a good crop. Here is the address given before the council of elders of an Iroquois clan:

“Great Spirit, who dwellest alone, listen now to the words of thy people here assembled. The smoke of our offering arises. Give kind attention to our words, as they arise to thee in smoke. We thank thee for this return of the planting season. Give us a good season,

that our crops may be plentiful. . . . Preserve us from all diseases. Give strength to us that we may not fall, preserve our old men among us and protect the young. Help us to celebrate with feeling the ceremony of this season. Guide the minds of thy people, that they may remember thee in all their actions."

Some tribes also had their thanksgiving harvest festival, which was a most joyful time, as it is with us.

Such, in brief, was the agriculture of the Indians who lived north of Mexico. Through long ages, no one knows how long, these people had been slowly learning, without books, schools, or teachers, how best to till their soil and raise their crops. Why had they not made more progress when America was discovered? Some think it was because they had no domestic animals except the dog. With cattle they might have become herdsmen and learned to make dairy products. With horses and oxen they would probably have learned to plow the land and so to raise larger crops.

It was very fortunate for the white men that the Indians were to some extent farmers; otherwise, both Jamestown and Plymouth, and perhaps other settlements, would have perished. Indian agriculture was the starting point from which the English settlers in America made their successful beginning; thus it became, to a larger extent than is usually thought, the basis of our agriculture. In this chapter there are numerous instances of Indian practices that were adopted by the whites; and there were still others that will appear as the story of American farming proceeds.

CHAPTER II

THE FIRST FARMERS OF VIRGINIA

WHEN the first settlers of Virginia, about one hundred in number, were ready to start upon their long ocean voyage from England, they were given some good advice by the Council that had charge of their affairs. They were told to find the most wholesome and fertile place for a colony, and then to set a part of the men to work at once to prepare the ground and sow. Moreover, they were not to depend upon the seeds they brought over from England, but to obtain grain from the natives for seed, as that would be most likely to prosper. Had this advice been followed, the early history of Jamestown would have been quite different from what it was. However, the Council was at fault also, for there seem to have been no farmers sent with the first shiploads. Few of those who came could wield the ax and hoe, and it was two years or more before a plow was brought from England.

Although there were great hopes of finding gold and pearls in Virginia, the officers of the London Company should have known that the settlers whom they sent out would need to get their support from the soil. In those days Englishmen were not accustomed to founding colonies in strange lands, and they had to learn by experience.

The landing at Jamestown was made on May 14, 1607, but it seems to have been nearly the first of June before

much planting was done — too late to get the best crops. Some vegetables were planted (including potatoes and melons), and a small amount of wheat; also some pine-apples, cotton and orange seeds, — but no Indian corn. Englishmen called all the small grains “corn;” but they knew nothing of maize or Indian corn. This grew only in America, and the settlers here and in the other colonies



LOG HOUSES OF EARLY SETTLERS

had to learn how superior it was to English wheat as a means of support during the first years in this country. Wheat did not flourish at Jamestown. The climate was too warm and the soil too rich; so the stalks were rank and the heads small. During the first winter in Virginia, the colonists were obliged to depend upon food obtained from the Indians. Some of them bartered their hoes, axes, and guns for corn and game.

The second season saw little improvement over the first, though the settlers set about clearing land. Instead of following the Indian methods, the "gentlemen" settlers blistered their hands chopping down trees. This



MAP OF VIRGINIA

brought forth many oaths, for each of which the punishment was a can of cold water poured down the offender's sleeve at the end of the day. No corn was planted this spring (1608). The men were discouraged because no gold had been found; some wanted their crops to fail so they could return to England. Then, in the autumn, John Smith took charge of affairs and, by his in-

fluence in securing corn from the Indians, saved the colony from starvation. The next spring (1609) Smith had two Indian prisoners teach the settlers how to raise corn, and forty acres were planted. Unfortunately, Smith was obliged to return to England that fall, and all the food was eaten as soon as it was ripe, instead of being saved for the winter. Some cattle, hogs, and chickens had also been brought from England, and these were next eaten. The settlers then ate their horses. Many died of starvation, and the survivors were about to return to England when Lord Delaware and more colonists arrived and stopped them. More cows and hogs were

now brought over and in the spring of 1611, under Governor Dale, corn was planted and a section between two rivers was fenced off, within which the cattle could be kept.

It will be remembered that at first the settlers all worked for the London Company — that body of merchants and other investors in England who owned Virginia and expected to make money from it. The fields were worked in common, and everything produced in the colony went into a "common store." This is one reason why agriculture did not succeed better at Jamestown in these first years. But this was changed when Governor Dale took charge of the colony in 1611.

Dale rented to some of the best among the settlers small tracts of land, three acres each, to work for themselves, upon payment of two and one-half barrels of grain per year; but each man must still work for the company for one month during the year. This plan gave the men more incentive to raise good crops and to take care of their tools and stock. Later, each family of new settlers was given a house and lot of twelve acres free of rent for a year, besides tools and live-stock. It was a number of years before those who had been working for the Company were given complete freedom and could get farms for themselves.

In 1612, John Rolfe, who afterward married Pocahontas, began the cultivation of tobacco. A hundred years earlier, tobacco had been taken from the West Indies to Spain; and its use had extended from one country to another in Europe. There was great demand for it, and the price was high. It was soon found to be a very valuable crop, so the Virginia settlers planted it,

to the neglect of grains and vegetables. To its cultivation they gave up their fields, their gardens, and even the streets of Jamestown. This, though very unwise, was quite natural, because, as John Smith said to the officers of the Company in England, a farmer could get six times as much profit from the same amount of land and labor by raising tobacco as he could by raising grain.



TOBACCO FIELD

As a result, there was actually danger that the people would not raise enough corn for the necessary supply of food. Consequently, Governor Dale made a rule that no one should plant tobacco until he had sowed two acres of grain. Later, there was a law that each settler must keep in store enough grain for food through the winter. When the Indians were troublesome, and especially after the great massacre of 1622, the settlers were loath to plant corn because the fields made good ambushes for the red men. A law was then made requiring each parish or group of farms to support a public granary, to which every person over eighteen years of age must contribute a bushel of grain yearly.

When all the farmers in Virginia were raising as much tobacco as they possibly could, the result was that the price fell from three shillings a pound at the beginning, to one penny — only one thirty-sixth as much. This led to a number of laws that were enacted by the House of Burgesses. One provided that all the tobacco must be brought to warehouses that were located in convenient places. Here it was inspected by a committee of farmers, who ordered that all of poor grade should be destroyed. Later, one-half of the good tobacco was to be destroyed in order to keep up the price. Other laws limited the number of leaves that might be gathered from each plant. Before 1680 the price had fallen to one-half a penny and the farmers were desperate. They tried to agree among themselves not to plant any at all for a year. This failing, some lawless bands started to destroy the growing tobacco in the fields, and two hundred farms were devastated. These riots were finally put down by the militia.

In the meantime, the Virginia farmers were trying some interesting experiments. A glance at the map of the world will show that Virginia lies in the same latitude as Spain, Italy, and northern Africa. Would it not be a fine thing, Englishmen thought, if we could get from Virginia the products we now buy from those countries? So they began the first year to plant pineapples and oranges. Frenchmen were brought over to begin grape raising, with a view to the making of wine, and a law was passed compelling every family to raise ten vines and to learn vine-dressing. The Virginians also tried to raise figs, lemons, almonds, olives, ginger, and sugar cane, but without success. The fact is that our eastern

coast has a climate quite different from that of southern Europe. The winds from the north and west come to Virginia over a great land area and are much colder in winter than those that prevail in the same latitude in Europe; consequently, the semi-tropical products do not thrive here.

The Virginians also tried very hard to produce silk, and there were great expectations of enormous profits from this source. The mulberry tree grew wild in Virginia, and silkworms were brought from Europe; some



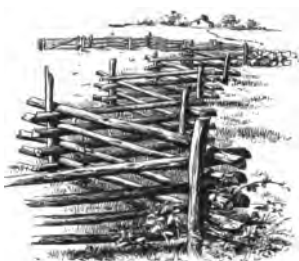
SILKWORM, MULBERRY LEAVES, MOTH, AND COCOONS

of these were frost-bitten in the winter. The law obliged every man to plant six mulberry trees annually for seven years. Later, a premium of five thousand pounds of tobacco was offered to every person producing one hundred pounds of silk; this not having any result, the premium was raised to ten thousand pounds of tobacco for fifty pounds of raw silk, and still later fifty pounds of tobacco were offered to the producer of one pound of silk. One reason for the failure of these plans is the fact that the care of silk cocoons and the winding of raw silk required much attention and some skill. But when

all the members of the farmer's family were fully occupied in the tobacco and grain fields, who was left to care for the silk? In the countries of southern Europe there were plenty of hands for such work, but not so in Virginia.

Other products that Englishmen wanted very much and had to buy, in part, of other countries were hemp and flax. A law of 1619 required that each family must have at least one hundred plants of flax; but these crops were raised only to a small extent. Rice, indigo, and cotton were also tried, but the crops did not succeed.

The colonists were more successful in raising live-stock. The cattle, sheep, and hogs were allowed to run in the woods and open glades, where there was abundance of food for them, and they increased rapidly in numbers. At first the Indians killed them; to avoid this the hogs were put upon an island in the James River, known as Hog Island. Later, the animals running at large in the woods became



ONE FORM OF WORM FENCE

wild and were hunted, just as deer were. The wolves kept the sheep from increasing, and later the colonial government gave bounties for the killing of wolves. Of course, the roving cattle and horses got into the cornfields; this made it necessary for every farmer to fence his fields or else not expect to get damages for the injury done by his neighbors' animals. Since there were no sawmills, and iron nails were expensive, fences must be built of rails split from the forest trees. Here were built the first "worm" rail fences in America.

It has already been stated that in the beginning the settlers of Virginia did not own the land they cultivated. This belonged to the London Company. Its product was intended first to support the people of the colony, and the surplus, if there was any, was to be the profit of the Company. Under Dale, some settlers were allowed to rent tracts as mentioned before, and after he left, in 1616, these and other settlers who had paid their way to America were given tracts of one hundred acres each. Soon after, members of the Company, having invested money in the enterprise, were given one hundred acres for each share of stock that they owned. Later, another hundred acres were added. Some of the members who did not come to America sold this right to settlers.

Another way in which land came to be owned was under the rule that any man who paid his own way to the colony might have fifty acres free; and he might also have fifty acres for every person that he brought to the colony. This was called a "head right," and in this way the greatest number of settlers got their farms and some settlers obtained very large tracts of land.

At this time there were thousands of paupers and unemployed persons in England. The poorhouses were full of children whose parents could not support them, and the jails were full of debtors and criminals. Now, anyone who would pay the expense of transporting such persons to Virginia was entitled to fifty acres of land for each one brought over as a servant. The latter agreed to serve for a term of four or six years, or more, without pay, as recompense to the one who had paid his passage. He thus became an "indentured servant." In this way many thousands of men, women, and children escaped

from the poverty and hard conditions of their life in England. The greater part of them became laborers upon the farms of Virginia and other colonies.

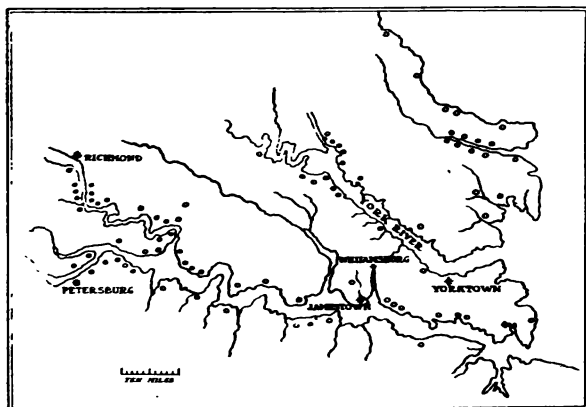
The officials of English towns and cities saw in this a chance to get rid of their paupers and criminals. They were sold to the owners of vessels and to ship captains, who carried them to America. When they arrived they were put up at auction. The farmers gathered about the human cargo and bid for their services, generally paying the shipmaster in tobacco or some other product. For each new servant the farmer was entitled to fifty acres more land.

It came about in this way that the population increased rapidly and the farms grew in size. Sometimes the "head right" was claimed whether a servant had been brought or not, and later the simple payment of a fee of a few shillings to the county clerk became sufficient to secure a tract of land.

We see here one reason why many farms in Virginia came to be very large; these we are accustomed to call "plantations." Another reason was the profitableness of tobacco raising and the fact that the best crops could be raised on fresh soil. When the law limited the number of acres or plants, the farmer was bound to get as much as possible for his work; consequently, he cleared a new field every few years and abandoned the old. Land was plentiful, and it was generally level and easily cleared by the Indian method. The large number of broad-mouthed rivers that may be seen on the map of Virginia enabled the colonists to press inland for long distances in their search for more land.

Their farms and plantations were laid out in this way:

a certain distance was measured on the bank of a river, depending upon the size of the grant that a settler had; then straight lines one mile in length were run back at right angles to the river from the two ends of this boundary. When all the land along a river was taken, another



MAP OF EASTERN VIRGINIA

Showing location of scattered plantations. Adapted from map of Fry and Jefferson, 1751.

tier of farms, bounded by straight lines, was laid out farther back in the country.

The only way to mark the boundaries was by blazing the trees or by erecting little piles of stones, and of course there were many disputes. Later, the law required that the farmers of each neighborhood should go in procession about the farms every year and trace the boundaries. If any marks had disappeared, these were renewed; if a dispute arose, it was settled by those present. The boys went along with their parents in this "processioning," and thus the memory of farm boundaries was carried down from father to son.

It is well known that the first negroes in Virginia were brought by a Dutch vessel in 1619. These became indentured servants, not slaves, as is commonly supposed, and some of them, at least, acquired their freedom at the end of their terms of service. Not a great many negroes were brought to Virginia for the next half century, the number of indentured servants who came being several times as great. In 1649 there were but 300 negroes in the colony, some being free, some servants, and others slaves. After that time the majority who were brought became slaves. Some of the planters who got great tracts of land, thousands of acres in extent, had many servants and slaves.

CHAPTER III

THE BEGINNING OF AGRICULTURE IN NEW ENGLAND

It was in December, 1620, that the Pilgrims built their first log houses at Plymouth. They faced a long, dreary winter before they could begin the work of farming that was to yield their main food supply. They were helped at this time by the stores of Indian corn that they had found buried. In the spring they used the fields near Plymouth that had been abandoned by the Indians, for a pestilence in this region had caused the natives to move away.

An Indian by the name of Squanto showed the Pilgrims how to plant corn. "Also, he told them," says Governor Bradford, "except they gott fish and set with it (in these old grounds) it would come to nothing." They planted wheat and peas, but these did not do well. The first harvest of corn was a good one; but the second year (1622) they did not raise enough to supply the growing colony for the winter. Governor Bradford gives several reasons for this: that they had not yet learned to raise corn; also, that they were engaged in many other employments (fishing, trapping, and lumbering); and finally, that much of the corn was stolen by the hungry settlers before it was ripe, "though many were well whipped for doing this." So they were obliged to buy a quantity of corn from the Indians.

Another reason for the poor success of the Pilgrims at farming in these first years was that, as in Virginia, the

colonists were not working for themselves separately. All their products were put into a common store. The Pilgrims adopted this plan because they were in debt to certain persons in England who had lent them money for the expense of their voyage to America. They hoped to make money in common for the payment of this debt. The result was that some shirked their work. So, in 1623, this system was abolished and each family



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A VIEW OF PLYMOUTH IN 1622

was granted a tract of land upon which to raise products for itself. This resulted in greater industry and even "the women now wente willingly into ye field, and tooke their little ones with them to set corne, which before would aledg weaknes and inabilitie."

The stories of Jamestown and Plymouth show the importance of maize in the history of these settlements. It was better adapted to the American soil and climate than were the grains brought from England. It yielded twice as much food per acre as any other grain. The corn

crop was less dependent upon changes of season, and its yield was more uniform. It could be harvested at any time within several weeks after its ripening, and the stalks and leaves furnished valuable fodder for stock. As the other colonies were founded, in one after another the value of this crop became known. Then, as people spread from the coast back into the interior, the first crop depended upon was corn. It was planted among the standing trees that had been killed by girdling. The seed was dropped where an ax or a hoe opened a slit

in the rich forest mold; and here it yielded an abundant crop the first year. Fortunate, indeed, for the settlement of our country was this gift of maize which was made by nature and the American Indian.



A BEAVER

Beaver skins were the staple in the fur trade.

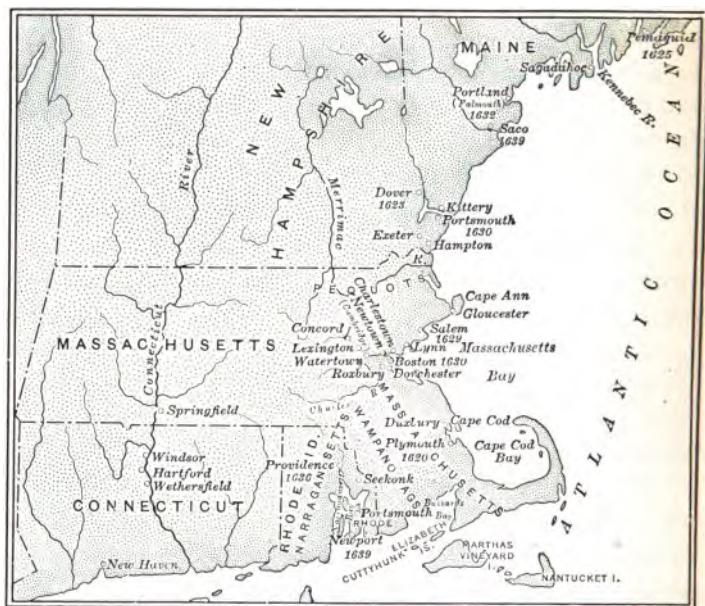
The Puritan settlers in the colony of Massachusetts Bay, who came about ten years after the settlement of the Pilgrims at Plymouth, founded Salem, Boston, and other towns near by. They found the winters cold and disagreeable as compared with the winters in England, but in the hot summers their crops grew abundantly, and after the first year they suffered no lack of food. Corn was their principal crop, and much of this they traded with the Indians for beaver skins. "Besides," says one of their number, "this country aboundeth naturally with store of Roots of great variety, and good to eat. Our Turnips, Parsnips, and Carrots are here both bigger

and sweeter than is ordinarily to be found in England. Here are also store of Pumpions, Cowcumbers, and other things of that nature." The cattle found tall, rich grass in open meadows, though the wolves were troublesome. The latter were caught with huge hooks baited with fat or tallow.

As in Virginia, the settlers of New England soon spread backward into the country. In Virginia the people moved up the broad rivers, each intent upon getting as much land and raising as much tobacco as possible, and paying little attention to the affairs of his neighbors. In this way the population became scattered, and there came to be many large plantations. In New England the method of settlement was quite different, partly because the nature of the country was unlike that of Virginia, and partly because the Puritans carried out certain religious and political ideas that they brought with them to America.

When the first towns had been established on the coast and it seemed desirable to some of the settlers that they should go farther in search of land, they did not move off as individuals, each looking out for himself, but rather in small companies, founding new towns. The Puritans generally came to America in groups, as fellow-villagers or members of the same congregation in England. It was natural that they should like to live together in the new country, and to keep up their little Puritan churches was one of their chief objects in coming. When new land became scarce near one of the original towns, a group or congregation would get a grant of land from the colonial assembly with permission to found a new town. From this town, again, other groups might separate in later years. Thus were formed the towns that grew into

the Rhode Island and Connecticut colonies — children of the parent colony of Massachusetts Bay. And thus all eastern and southern New England came to be sprinkled with towns, in which the people were chiefly farmers.

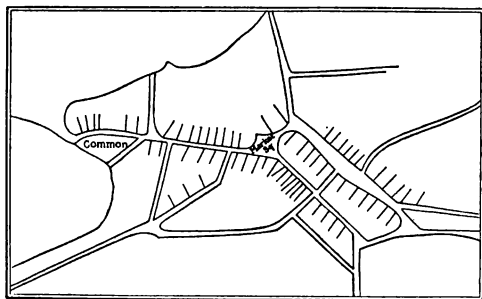


NEW ENGLAND IN THE SEVENTEENTH CENTURY

These towns usually contained thirty-six square miles, though some were larger, and they were sometimes bounded by straight lines; but their shapes were of great variety, not often rectangular. Rivers and other natural features were most often used as boundary lines. The band of men who founded the town were called the proprietors; they owned all the land. The first step after the boundaries of the town had been settled was to select

the site for the houses — for the people, they thought, should live in a village and not on scattered farms. Upon the village site a “common” was laid out, and there, or near by, was the meetinghouse and perhaps a blockhouse for defense. Near the church, and running back from the sides of a wide street, were laid out narrow strips known as “home lots.” These were, on the average, about six acres in extent, though they varied greatly in different towns and among the families of the same town.

Upon the home lot each family had its house, barn, and other buildings, its garden patch, and a small field for inclosing and feeding the stock.



PLAN OF AN OLD NEW ENGLAND TOWN
Wethersfield, Conn. — Showing house lots.

New England has few level tracts of large

extent. Consequently, each town contained within its limits several kinds of land — “upland,” meadow, and marsh. Now, each proprietor had, besides the home lot, a strip of upland and another of meadow. There were usually two or more tracts of upland in a town, and as many of meadow, so each proprietor might find his property scattered in strips in several different localities. But he must live in the village, as the law obliged him to attend church regularly; he went out each day to till his fields, returning at night. The amount of land owned by each proprietor depended upon several things — his

wealth, the size of his family, and his social and political importance as a man in the community.

Very often a piece of tillable land was held by the proprietors "in common"; that is, each built a part of the fence that surrounded the entire field, and it was decided at a meeting or by a committee what crops should be planted and when they should be planted and harvested. Though each proprietor had his own strip in this field, all joined in the work of plowing. But there was no common ownership of the crops. In such a common field, after the harvest was gathered, the herd of the town would be permitted to graze.

Meadow lands were often held in common. Each farmer was allowed to gather hay and later to pasture there a certain number of cattle. The wooded lands that the proprietors did not at first divide were owned in common. The people of the town gathered their timber for their houses and fire-wood. It soon became necessary to pass laws against wasting the timber by burning it in order to clear the land.

One may ask why the Puritans took these methods of laying out and cultivating their farms, that seem so peculiar to farmers of to-day. The answer is found in the fact that much of the cultivated land in England was managed upon this plan. The practice of farming in common had grown up in the course of centuries, but was destined to disappear again; and in New England the land system that has been described soon began to be modified. As the population increased in numbers by the addition of other settlers, the newcomers might be admitted as proprietors and given land like the rest; or, they might simply be "residents." In the latter case they could

buy tracts for themselves and might also acquire strips in the common fields. As the villages grew, some of the original settlers became carpenters, cobblers, millers, and tradesmen, and were glad to dispose of their scattered strips. Gradually, little compact farms were founded, each with its farmhouse and tract of tillable land, meadow, and wood lot. Many of the farmers worked in winter as lumbermen or trappers, while on the coast they fished or followed some other occupation.

In New England, as in Virginia, it was difficult to keep live-stock, especially sheep, from being eaten by the wolves. Consequently, many animals were taken to the islands in Boston harbor, in Narrangansett Bay, and elsewhere along the coast. Often a peninsula was fenced off from the mainland, where the stock would be safe, as at Nahant.

In the interior, much stock, especially cattle and hogs, ran wild in the woods. But everywhere the milch cows had to be carefully guarded. A town officer known as the "cowherd" drove the cows to the distant pasture or woodland in the morning and back again to the village at night, after watching them all day. He blew a horn soon after sunrise as a signal that the cows from each house-lot must be milked and ready to start. When he returned in the evening, with his slowly moving herd, the wife or daughter of each household along the shaded village street stood at the gate with milking-stool and pail. The cowherd sometimes kept the sheep of the village, but often there was a shepherd as well. In at least one town the herdsmen were assisted by the boys and girls, and the law provided that these must have some other occupation also, such as spinning, knitting, or weaving tape in.

order that they might not "be suffered to converse together."

Since the sheep had to be carefully inclosed at night, the farmers of a village often united to make a portable fence, each furnishing a certain number of lengths, or "gates," as they were called. This fence was moved about from one field to another, so that each farmer in turn got the benefit of the sheep manure.

In many towns there were officers called goatherds and swineherds, or hog-reeves. Other officers were the fence-viewers, who regulated the fencing of the common fields and inspected the fences that bounded the towns. The hay-wards were the guardians of the fences and the cattle. The pound-keeper took up stray animals and kept them in the village pound until they were redeemed by the owner upon the payment of a small fee.

All of the officers mentioned were chosen in meetings of the proprietors or of all the voters; and the numerous regulations about the division of land and the management of the common fields and the stock were also decided in these meetings. The New England "town meeting" decided a great many petty details after free discussion. This practice gave the people valuable lessons in government and also fixed the habit of self-government.

Neither in New England nor elsewhere in the colonies in these early times was much care taken of the stock. The animals were not well fed (if fed at all) in the winter, and consequently in the spring those that had not perished were almost too weak to stand. It was the regular morning task of some farmers, in the early spring, to lift the poor cattle to their feet.

• This will not seem so strange if we remember that the

same general conditions prevailed in England. It was only during our later colonial period that the use of tame grasses and the feeding of turnips to cattle in the winter were becoming common in that country.

In the early years of the New England colonies, while there were many thriving fishing villages and commercial towns along the coast, by far the greater part of the people were farmers. As they opened up this new region they built log houses, often thatched with reeds, with oiled paper windows and heavy doors and shutters. The great chimney and its hearth were the chief features of the living room. The furniture was homemade and massive. Here in the home were carried on many other occupations besides farming: spinning, weaving, tailoring, shoe-making, carpentering, and dairying. In short, each household raised and made whatever was necessary for its own living, except such products as tea, coffee, sugar, and spices. This continued to be the nature of farm life in New England, and agriculture continued to be its leading occupation, until after the great changes that came about at the time of the War of 1812.

CHAPTER IV

THE MIDDLE COLONIES AND THE CAROLINAS

THE first farmers of New Netherland were servants of the Dutch West India Company. This company, founded in Holland for the purpose of carrying on trade, established a trading post on Manhattan Island. In 1626 the island



A BOUWERIE ON MANHATTAN ISLAND

was purchased from the Indians. Then some farmers and negro slaves were taken there by the Company and were set to work clearing land near the fort at the southern end of the island. The land was divided into six "bouweries," or farms. These were rented to tenants, the Company building the houses and barns and furnishing the live-stock. The Company had its own farm, be-

sides, worked by servants and slaves, and it granted land to some individual farmers.

But people were slow in coming from comfortable old Holland to the hard life of the New World, even to such a beautiful and fruitful region as that of the Hudson Valley. Partly for this reason the West India Company made a great plan by which, it was thought, settlers would be induced to come. According to this plan, a person who brought to the colony fifty adults within four years was to be given a tract of land with a frontage of sixteen miles on the Hudson (or eight miles on each side), and as far back into the country as desired. The "patroon," as he was called, was obliged to divide his estate into farms, erect buildings, and furnish stock and tools for each tenant. The latter would then pay a certain rent, generally in the form of produce, and the patroon would also get a part of the increase of the stock. The tenant was not allowed to sell the rest of his crops until the patroon had been given a chance to buy the produce. He agreed to have his grain ground at the patroon's mill and to get a license to hunt and fish. Furthermore, the tenant bound himself not to leave the estate for ten years, during which time he was free of taxes. The patroon was an official, as well as a landlord, and before him cases were brought as to a court.

This plan was destined not to succeed. Only one



DUTCH PATROON OR
LANDED PROPRIETOR

estate, that of the Van Rensselaers, was important in later years. What farmer wanted to be bound by all these conditions, in a new country where land could be had for the asking, or could be taken without asking? The Company later made new plans under which men could easily acquire the ownership of farms. More Dutch



ANCIENT VAN RENSSELAER MANSION
At Greenbush, near Albany, N. Y.

now came, but even larger numbers of settlers from England and New England found good locations on the banks of the Hudson and on the shores of Long Island. Here they founded little towns and managed their farms and common lands much as was done in New England. Later, after the English conquered New Netherland (1664) and made it New York, more large estates were founded on the Hudson. Some, such as those owned by the Schuyler and Livingston families, were called "manors." On these estates some slaves were found and some indentured servants; but most of the laborers were tenants, who brought their rents to the manor house twice a year and were then given a great celebration and barbecue.

As the settlers cleared the land and made their farms farther up the Hudson and then spread westward, along the valley of the Mohawk, they found the soil to be exceedingly rich. One observer, writing in 1655, said that wheat was raised for eleven years in succession on the same field, and that for nine years he had not seen manure used on any farms. Wheat and barley grew so rank on fresh land, sometimes six or seven feet high, that there was little grain in the heads. The leaves of tobacco plants were three-fourths of a yard long. The farms of New York soon became noted for the production of fruit and vegetables. On Long Island great herds of cattle roamed. Many persons kept goats instead of sheep, because of the milk they gave, and because they were better able to defend themselves against the wolves.

When William Penn founded his colony, he made it easy for settlers to acquire land. He sold one hundred acres for £2 and the payment of an annual "quit-rent" of one shilling for each such tract. A person who was too poor to buy land might rent a farm at the yearly rate of one shilling per acre. Many thousands of poor people came to Pennsylvania as indentured servants. The cost of their passage could be paid for by a few years' service. Very often a servant was able to earn enough by extra work during this time to buy a farm, or he might work a while after his discharge, as a laborer on wages. Some poor families had their children indentured during the years when they were getting a start. Often the newly freed servant would go into the wilderness, build a little hut, and depend largely upon hunting until he could buy implements and stock.

Penn had travelled in Germany and had seen how

wretched many of the people were. The poor peasants were unable to acquire farms of their own, and their landlords made heavy exactions. In the frequent wars of that time their crops and homes were destroyed and their sons were forced into military service. He had circulars telling about the beauty and richness of Penn-

Redemptioners.

THERE still remain on board the ship *Aurora*, from Amsterdam, about 18 passengers, amongst whom are,

Servant girls, gardeners, butchers, masons, sugar bakers, bread bakers, 1 shoemaker, 1 silver smith, 1 leather dresser, 1 tobacconist, 1 pastry cook, and some a little acquainted with waiting on families, as well as farming and tending horses, &c. They are all in good health. Any person desirous of being accommodated in the above branches will please speedily to apply to

Captain JOHN BOWLES,

in the *Stream*, off Fell's Point:

Who offers for Sale,

80 Iron-bound Water Casks

1 chest elegant Fowling Pieces, single and double barrelled

15,000 Dutch Brick, and

Sundry ships Provisions.

July 24.

d3k.es4t

ADVERTISEMENT OF SERVANTS FOR SALE

sylvania printed and sent there. This resulted in the coming of large numbers of Germans to his colony, where they became thrifty farmers.

Everywhere there were forests, but these were quickly cleared by the Indian method. The soil was a rich black loam, easily plowed, and yielding im-

mense crops. It was soon found that wheat grew well in Pennsylvania, and this became its chief crop. There was also much hemp and flax raised.

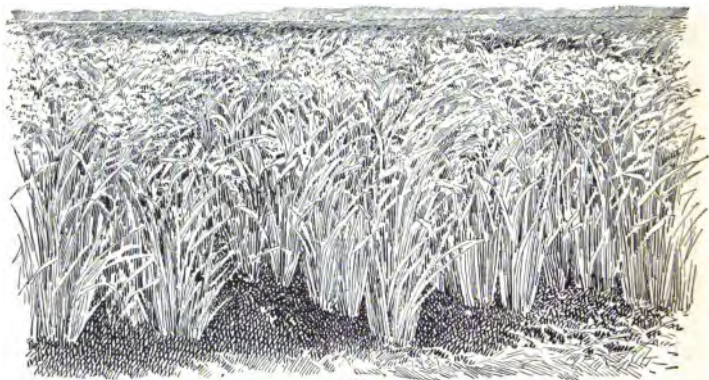
In the settlement of Maryland, much the same conditions were met as in Virginia. The broad rivers and the arms of Chesapeake Bay made it easy for farms to spread to the interior. The soil was exceedingly rich; the gentle slopes were covered with fine open forests. The settlers had learned from the experience of the Virginians how to avoid the troubles of the first years in

the new colony. They brought food and seed, as well as goods with which to buy corn from the Indians. There were some large estates, or manors, in Maryland, upon which tenants and indentured servants worked. But small landowners each got one hundred acres and as much more for each member of the family who came to Maryland — all for a small annual payment, or “quit-rent.” The grains were grown, but tobacco became Maryland’s chief crop. Here, as in Virginia, it was used for money.

The experience of Raleigh’s colony on the coast of North Carolina showed that it was not easy to begin farming in that locality. The soil was sandy and swamps abounded. The first farmers came to this colony from Virginia. Some were poor men in search of land to be had for nothing. Others had been indentured servants. Still others were lawbreakers, or were in debt, and had run away for fear of punishment. Small farms were the rule in North Carolina. They were located on the rivers and produced chiefly tobacco and corn. Many Germans, Swiss, French Huguenots, and Scotch-Irish came to this colony. The last mentioned came from the north of Ireland and were a thrifty class of people. More will be said about them later.

South Carolina had quite a different agricultural history in colonial times from that of her sister colony on the north. Many efforts were made to raise semi-tropical products in South Carolina, but none was very successful until rice was planted. The introduction of rice is said to have come about in this way. Thomas Smith, Governor of South Carolina, had previously lived in the island of Madagascar, off the east coast of Africa, where rice grows abundantly. In the year 1693 a vessel from Mada-

gascar happened to be in the harbor of Charleston, and the captain inquired for Governor Smith. In the course of their visit, the Governor asked if the captain could furnish some rice for seed. The cook of the vessel found a small bag of it in his kitchen. Governor Smith planted this in his garden and it prospered so well that others soon began its cultivation. At first rice was grown



RICE FIELD

upon dry soil, but swamp land was found to be better, so the wet lands along the rivers came to be the best fields. Slaves were set to clearing this land of brush and weeds. By a system of dikes and ditches, water could be let in and drawn off the fields. After the rice began to grow, the field was flooded as a means of keeping down the grass and weeds. The plant grew so abundantly that the cost of a slave could sometimes be paid for by one year's harvest. Soon rice became the greatest single product of South Carolina.

The white laborers found work in the rice fields during the hot summers to be intolerable, and, as a result, more

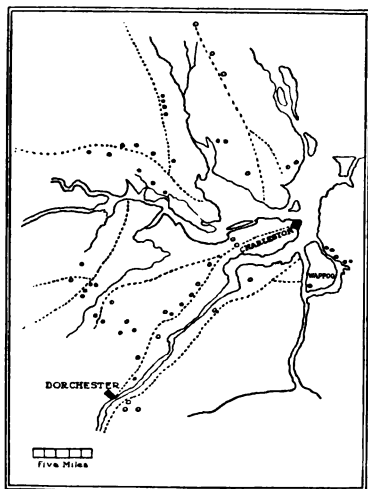
negro slaves were brought in by those who could afford to do it. As the poorer farmers could not raise rice and sell it so cheaply as those who had large fields worked by slaves, they sold their farms and moved into the interior. Thus it came about that there were eventually many large plantations along the rivers of South Carolina. The planters and their families found it pleasant to live for a part of the year in Charleston, though they had beautiful homes on their plantations. The slaves were left in charge of overseers, who sometimes treated them badly. The heat, the work, and disease killed off the negroes rapidly.

There was much work connected with rice culture after the grain was ripe and had been cut. First, it was threshed with a flail; then by means of a pitchfork the straw was removed from the threshing floor. The kernels of grain still bore the husks and these were broken off by being pounded in a mortar, which might be the hollowed-out end of a stump. After this the grain was winnowed. This was done by hand and was very hard work. The invention of a fanning mill made the process much easier. The mill was driven by horse-power, by the tide, or by the wind. The rice was finally packed in barrels, for the manufacture of which every plantation had its cooper-shop. Before the Revolution, South Carolina exported 125,000 barrels of rice yearly.

The South Carolina crop that came to be, during colonial times, next to rice in value was one that is no longer a product of this country, namely, indigo. This plant is now of much less importance than it was in those days, because we have other materials, made from coal tar, that are used for dyeing cloth blue. But at that time the

indigo plant was the best source for the blue dye, and its product was very valuable. Most of the indigo used in European countries came from the East Indies; but it was also produced in the West Indies.

Strange to say, the colony of South Carolina is indebted for the beginning of its indigo culture to the work of a young girl. This was Eliza Lucas, who was destined



VICINITY OF CHARLESTON, S. C.

Showing plantations and roads. After Stuart's map, 1780.

to become the mother of Colonel Charles Cotesworth Pinckney, a brave Revolutionary soldier and afterward a member of the convention that framed our Constitution. Later, he was a prominent Federalist statesman and was minister to France at the time of the X. Y. Z. troubles. Eliza Lucas was the daughter of an English army officer who was stationed in the island of Antigua in the West Indies. Colonel Lucas moved his family from

Antigua to South Carolina for the benefit of his wife, whose health was delicate. He had resided there but a year or two when he was recalled to Antigua, as war had broken out between Spain and England. This was in 1739, when Eliza was but sixteen years of age. The management of their plantation now fell largely upon this young girl. Fortunately she had a liking for experi-

ments in agriculture, and excused her various schemes by writing, "I own I love the vegetable world extreemly."

The Lucas estate was located on Wappoo Creek, a few miles south of Charleston. Eliza's description of the surrounding country, as she wrote it to her brother, who was being educated in England, is interesting. "I now set down my Dear Brother to obey your commands and give you a short description of the part of the world I now inhabit. So. Carolina, then, is a large and Extensive Country near the Sea. Most of the settled parts of it is upon a flat — the soil near Charles Town Sandy, but farther distant clay and swamp land. It abounds with fine navigable rivers, and great quantities of fine timber. . . . The soil in general very fertile, and there is very few Europeans or American fruits or grain but what grow here. The Country abounds with wild fowl, Venison and fish, Beef, veal and mutton, are here in much greater perfection than in the Islands, tho' not equal to that in England — but their pork exceeds any I ever tasted anywhere. The turkeys extreemly fine, especially the wild, and indeed all their poultry is exceedingly good, and peaches, Nectarines and mellons of all sorts extreemly fine and in profusion, and their Oranges exceed any I ever tasted in the West Indies or from Spain or Portugal. . . . We have a most charming spring in this country, especially for those who travel through the country, for the scent of the young mistle and the yellow Jesamin with wch the woods abound, is delightful. The staple commodity here is rice, and the only thing they export to Europe — beef, pork, and lumber they send to the West Indies." ¹

¹ This and other quotations are from H. H. Ravenel's *Eliza Pinckney*.

What were the products of this fine Carolina estate under the management of Miss Lucas? In her letters to her father we find mention of, "Indigo, Ginger, cotton, lucerne, and cassada;" also, pitch, tar, and lime. She sent to her father in Antigua at one time white oak staves, bacon, and salted beef; at another "2 barls Rice, do corn, 3 do pease, and pickled pork, 2 kegs Oysters, one, of eggs by way of experiment putt up in salt."

The first three or four years of experimenting with indigo were disappointing. Frost and cut-worms prevented its growth. In 1742, Eliza wrote to her father, "I make no doubt Indigo will prove a very valueable



INDIGO PLANT

commodity in time, if we could have the seed from the East Indies time enough to plant the latter end of March." A few years later, through her persistence, the success of the crop was assured, and seed was distributed from the Lucas estate to the planters of the surrounding country. Before the Revolution broke out, South Carolina was exporting over a million pounds of

indigo annually, valued at more than £50,000.

The indigo plant is a shrub that grows three or four feet high, with bluish-green leaves. The leaves, or sometimes the entire plant, were put to soak for a number of hours in a vat full of water. This process removed the coloring matter. The water was then drawn off into another vat standing near and below the first one. Here the water was beaten with paddles until the coloring matter became thick. Again it was drawn off into a

third vat and here allowed to settle. The thickened sediment was then taken out in cakes and put to dry in sheds. The whole process required much skill and was a very disagreeable one on account of the bad odor and the swarms of flies that gathered about. Mr. Lucas sent a man from the West Indies to make indigo on his plantation. He seems to have purposely spoiled the material in the process; but Eliza discovered what he was doing and dismissed him.

The English government, wishing to encourage this crop, paid a bounty of sixpence a pound to persons in England who imported it from the colonies. This enabled the English merchants to pay a better price for it. After the Revolution, of course, this bounty was no longer paid, and the English imported more from the East Indies. Indigo culture in South Carolina then declined; fortunately, just at this time cotton production came in to take its place.

Later in life, Eliza Lucas, now Mrs. Pinckney, experimented with silk raising. She had little negroes pick mulberry leaves upon which to feed the worms, and the old women assisted in winding the raw silk. Mrs. Pinckney carried on this work so carefully that she produced enough raw silk for the making of three dresses. When she went to England in 1753, she had this silk woven into cloth and gave one of the dresses to the mother of George III, who was then Prince of Wales.

In spite of the efforts made by Mrs. Pinckney and many other persons, silk culture never grew to be of any importance in the Carolinas, or elsewhere in this country. This is because there were more profitable crops. The West Indies furnished a good market for grains and

meats; rice and indigo commanded good prices in Europe; and for the production of these commodities there existed in the Carolinas not only excellent soil and climate, but the right labor conditions as well.



COLONIAL WOODEN
MOLDBOARD PLOW

CHAPTER V

SOME GENERAL FEATURES OF COLONIAL AGRICULTURE

THE preceding chapters have told the story of the first efforts at farming made by the early colonists. In the course of the century or more that passed before the Revolution, the people of the Atlantic coast region settled down into fixed agricultural habits and customs. These were not greatly changed during the period of important political events that followed. The Revolution, the adoption of the Constitution, and the starting of the new government under President Washington do not constitute events in our agricultural history, as they do in our political life. It is now proper to ask, what were the ways of farming that these people adopted so naturally and that they still kept with slight changes until the nineteenth century had well begun?

Let us first inquire, was colonial agriculture merely English agriculture carried across the ocean? By no means! One important difference may be found in the matter of land ownership. While in England many cultivators of the soil owned their own farms, and while there was a great deal of ownership in common by the people of a village, there were yet greater numbers of people who were tenants under more or less hard conditions on the estates of the large landowners. The possibility of acquiring independent ownership of a farm was much less in England than in America. Here, every industrious worker (except the slave) could become a

landowner if he would. Besides all the easy ways that the laws provided by which land might be acquired in the colonies, there was everywhere another way — the man with courage and strong arms could go beyond the limits of settlement, and with ax and gun make the beginnings of a home without asking permission of anyone. To be sure, he might later be asked to pay for the land he had taken, or else be driven off. In England there was no such "free" land. This difference between the Old World and the New (for the same general conditions existed at this time on the Continent as in England) is one of the most important facts of American agricultural history. It had great influence in many ways, as will be shown in later chapters.

In the next place, it may be asked, did the American colonists follow English methods of cultivation on their farms? Now, the century when the colonies were growing, from 1650 to 1750, saw in England the beginning of great improvements in agriculture. Before that time there was scarcely any scientific knowledge of soils and crops. The people knew, of course, that they could not keep on cropping a field without destroying its fertility. But the only way they had of keeping the soil in good condition was to let it lie idle for a year. They did not have enough stock to provide the manure necessary for fertilization. So the farms were divided into fields, usually three in number, each one of which, in rotation, was left fallow for a year. On one of the remaining two there would be planted a fall crop, and on the other a spring crop. The vacant field was plowed, and after a year's rest was found to be in better condition. This was called "bare fallowing."

About this time it was learned that the field left fallow might as well be planted to clover, or some similar crop; this would restore some elements of its fertility, though the reason for this fact was not known. It was also found that crops of turnips and other roots and vegetables might profitably be rotated with the grains, and that the roots might be fed to stock. Using these crops for the winter feeding of cattle resulted in more manure, which was valuable in keeping up the fertility of the entire farm.

English landlords and farmers were very slow in adopting these new ideas; but they put them into practice gradually. Just before the American Revolution it was fashionable in England for gentlemen of means to devote much time to the management of their estates, trying experiments, studying the latest methods, and vying with each other in producing the largest crops and the finest stock.

One such enthusiastic landlord was Lord Townshend, father of that Lord Townshend who was the author of the hated taxation acts of 1767, placing duties upon tea, glass, and painters' colors imported into the colonies. Lord Townshend made so much of the new ideas that he was called "Turnip Townshend." He rotated his crops and thus avoided the wasteful practice of bare fallowing. At the same time the work of Jethro Tull was having great influence in England. He invented a drill and also a "horse-hoe," or cultivator. He wrote much upon the advantages of seeding by a drill, instead of broadcast, and upon the value of deep plowing and the thorough cultivation of the soil.

Undoubtedly many of the farmers who came to America

knew about the new agricultural methods then coming into favor in England. But they did not set themselves at once to put them into practice. Here they found a virgin soil, rich almost beyond belief, instead of one worn by centuries of cultivation. They even found some that was too rich for wheat — it must first be reduced by crops of corn or tobacco. But everywhere the soil became worn, sooner or later, and the farmers would have been driven to the old English methods of fallowing, or the new methods of clover and turnip crops, had there not been an easier way out of the difficulty. This was to take new fields of fresh land; and this is what they did throughout the colonies, so long as the supply of land lasted.

With the crude implements of the time, only a small number of acres could be cultivated by one man. Therefore, when he acquired one hundred, or several hundred, acres, as he might easily do, the farmer had room in which to open up fresh fields for many years, leaving the worn-out ones to grow up to grass, weeds, and brush. Besides, there was always the frontier, with its tall forests standing guard over the rich mold of centuries. On these new lands larger crops could be raised than the old land would yield with the most careful kind of cultivation known to the colonists.

Thus it was that while English farmers were learning new methods of *intensive* agriculture, the Americans were everywhere practicing *extensive* agriculture, because it was easier and cheaper. The land was plowed carelessly; the crops were not half cultivated; fences, where any existed at all, were neglected; and the edges and corners of fields were overgrown with weeds. American

farms had a ragged, neglected appearance, and the buildings were few and poor. So noticeable were these facts that they were often remarked upon by European visitors to the colonies.

In one account of colonial agriculture written at that time it is stated that the farmers "seem to have but one object, which is plowing up fresh land. The case is, they exhaust the old as fast as possible till it will bear nothing more, and then, not having manure to replenish it, nothing remains but to take up new land to serve in the same manner. . . . One would imagine that the error of such conduct would soon be discovered and rectified of itself; but the American planters and farmers are in general the greatest slovens in Christendom; plenty of land ruins their husbandry in every respect of general conduct — neatness, good management, spirited attempts, etc." So shiftless were their methods that it was not at all unusual for the farmer to move his barn away from the manure pile, when the latter became too large.

Such are the most general facts concerning colonial agriculture. Of course, there were many exceptions. We have seen how, in Puritan towns, sheep and cattle were used to fertilize the fields. As time went on, many farmers in all the colonies were driven to more careful cultivation of their fields. This was especially true in New England. Here Jared Eliot, who had travelled in Europe, taught and wrote about the necessity of clover crops and other improved methods. He brought from England a "horse-hoe" and urged farmers to plow deeper than was the custom.

Everywhere in the earliest times, and always on the frontier, the live-stock ran wild in the woods. The

animals were generally branded. Often the farmer called his cattle and pigs to the barnyard at night, where they were given a little feed; and they usually stayed near during the winter. But they were given little or no shelter. It was a belief of some in early Virginia that it would kill a cow to keep her housed and to milk



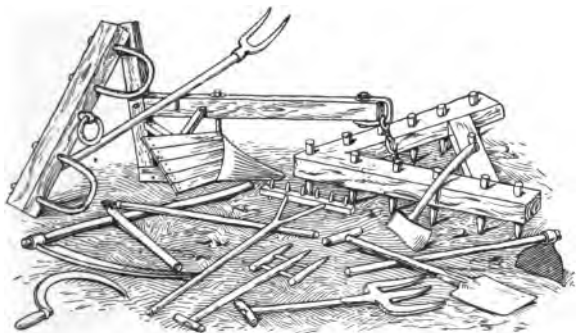
THE SOUTHERN PINE
WOODS HOG

her during the winter. As a result of their poor treatment, horses and cattle became smaller, and more lean and ragged, through succeeding generations. Swine became thin and scrawny.

The average fleece of a sheep weighed only two or three pounds, and a horse that was thirteen or fourteen hands high was considered of good size.

Agricultural implements were few and very crude. Oxen were generally used for plowing. They were stronger and steadier than horses and were less injured by the exposure and hard work of the colonial farm. There were no iron plows in the colonies. The frame and moldboard were of wood; on the latter were nailed pieces of scrap iron, old horseshoes, or any bit of metal that came handy. The point and share were, indeed, of iron, and cost as much as the rest of the plow. Some farmers used a one-handed plow, which was guided by one hand, while in the other was held a stick with which the dirt was constantly scraped from the moldboard. One can readily understand that under the circumstances deep plowing was impossible. Some farmers comforted themselves with the belief that deep plowing ruined the soil anyhow!

Sickles and scythes cut all the colonial grain. The short, heavy English scythe was improved by Joseph Jenckes of Lynn, Massachusetts, who made the blade



FARMING TOOLS OF LATER COLONIAL TIMES

longer and thinner, and strengthened it by welding a bar of iron on the back. The plow, the wagon or sled, and a rude harrow, generally with wooden teeth, were the only farm implements drawn by horses or oxen; all other work was done by hand.

It has been stated that the presence of so much rich land, almost free to everybody, made colonial agriculture different from that of the Old World with respect to ownership and methods of cultivation. There were other great differences. Here there was more land than the people could use, while in Europe there were more people than the land (as it was then cultivated) could sustain. Consequently, while farm laborers were plentiful abroad, they were scarce and often could not be hired at any price in America. Why should a farm laborer continue to work for hire when he could earn enough in a few years to buy himself a farm? Even the

indentured servants, of whom there were many thousands, worked to the end of their terms within a few years and soon became owners of farms. Many of these servants were harshly treated and ran away from their masters. If caught, they were flogged, and their terms of service might be lengthened. The majority, however, acquired land, often on the frontier, and became respectable farmers.

In the earlier part of the seventeenth century most of the immigrants from Europe settled in New England and in the other northern colonies. After the middle of that century a change came about. When the Puritans under Cromwell defeated the forces of the Royalists under Charles I, and then cut off his head and established the Commonwealth (1649-1660), many of his followers came to Virginia and took large tracts of land for tobacco raising. Here and in South Carolina there was great demand for labor, since the only limit to the wealth a man might obtain was the amount of soil that he could bring under cultivation. Consequently, we find many negro slaves brought into these colonies.

The New England shipowners and merchants took part in the business of bringing negroes from Africa to America; for at this time they were finding a good market in the West Indies for their cod and other fish, and for barrel staves and salt meats. Here they obtained cargoes of sugar and molasses that were taken to New England and, in part, distilled into rum. The rum formed a part of the cargoes of vessels sailing to the west coast of Africa. Negroes were bought, or forced on shipboard, and thus the supply of laborers for the southern colonies was kept up. How different were all these

conditions from those existing at that time in the mother country!

Another result of the new conditions that Englishmen found in America was the fact that the average man made a much better living here; and there were no paupers. In European countries the care of paupers was a great burden, and the suffering of the poor was pitiful. Here, the demand for laborers, the high wages, the ease with which land could be obtained, and the bountiful crops — all made poverty a rare condition. Indeed, the woods and waters might furnish much of a farmer's living: game and fish were so abundant that in the southern colonies, it is said, a man could in half a day obtain food that would last two families for a week.

In the colonies, since there were few large cities, and since agriculture was everywhere the principal occupation, the largest class of people were the owners of small farms; and these, while hard-working, lived lives of comfort and enjoyment unknown to most European farmers. In fact, there was no such middle class of well-to-do farmers in any European country at that time.

By the end of the colonial period, the farmers of America had accomplished several great things: (1) They had learned all the lessons in agriculture that the Indian had to teach. These lessons were very valuable, especially in the easy clearing of land and the use of Indian corn. This crop not only saved their lives in the beginning, but also became the most important source of food in the colonies. (2) The colonists had done a great deal of experimenting with all sorts of crops, especially those of semi-tropical countries, and had learned which were and

which were not adapted to their soil, climate, and labor conditions. So well did they do this, in fact, that for more than one hundred years after the colonial period no new crop of importance was added except one, sorghum. (3) While the system they had adopted was, for them, the most profitable method of farming, it was so wasteful of forests and soil that it has been called "land butchery." This plan answered their purposes for the time being, but it robbed later generations of great wealth.

By the methods that have been described, faulty though they were in certain ways, the colonial farmers came to be, on the whole, the most independent, contented, and well-fed class of working people in the world.

CHAPTER VI

COLONIAL AGRICULTURE, NORTH AND SOUTH

IF one had travelled from Maine to Georgia, in colonial times, he would have seen a great difference between the farms of New England and the large plantations of the South. Its physical features helped in making New England a country of small farms. Besides, the climate was such that it did not pay to have slaves; for ignorant negroes from Africa could not easily learn the various occupations that kept the farmer and his family busy during the long winters. Then, too, the good harbors of the coast and the fish of the North Atlantic attracted many persons to commerce, shipbuilding, and fishing. The people who followed these occupations lived in towns that furnished good markets for the farmers' produce. This fact, in turn, made land more costly, so that one person could not afford to buy a great estate, even if the crop and supply of laborers had been such that he could have cultivated it. Although at first land was given away in New England, it came to be worth many times as much per acre as that in Virginia.

The farms of New England yielded a variety of crops. One Puritan said that his farm furnished everything the family needed the year around, except some ten dollars' worth of such necessities as iron and salt. There were wool and flax for clothing, corn, wheat, and rye for bread, and pumpkins for "sauce" and pies; the gardens contained

all kinds of vegetables, though potatoes were not much used in early colonial times. Some thought that a man who ate them regularly for seven years would surely die!



FLAX

Tomatoes were either unknown or used merely as a garden decoration. They were called "love-apples," and were thought to be poisonous. Every farm had its live-stock, from which came a bountiful supply of milk, beef, pork, mutton, ham, and bacon. The latter were smoked in the broad chimney or in a "smokehouse." Much beef was salted, since those were the days before ice was

stored. Quantities of salt meats, besides live-stock, were shipped to the West Indies, where the planters kept their slaves employed raising their most profitable crop — sugar — and preferred to buy their food supply.

When flax was grown on the New England farm there were many different processes to be carried on, in some of which the children could assist their parents. By them the field was weeded when the plants were young. When the flax was cut the seeds were removed and the stalks were tied into bundles and stacked. Later, they were laid in a ditch and covered with water, so that the bark and worthless parts of the stem rotted and could be re-



FLAX BRAKE

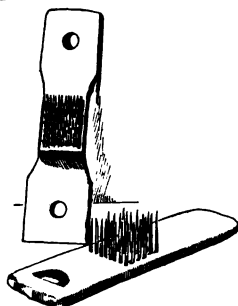
moved from the good strong fiber. In doing this the flax brake was first used. Afterward, the bunches of broken stalks must be hacked, or hatched, several times. The hetchel was a board through which sharp spikes were driven; the flax was first thrown upon the points and then drawn through the spikes until the fibers were straight and clear of refuse. The Scotch-Irish of New Hampshire made much linen from their flax; but larger crops of flax were raised in the middle and southern colonies than in New England.

Hemp was another farm product more abundant in New York and Pennsylvania than in New England.

Its fibers were cleaned and separated in much the same way as those of flax.

The New England farm boy of colonial times was not allowed to tempt Satan by any show of idle hands. He could not hold one of his father's clumsy plows, but he might ride on the beam and thus help to keep it in the furrow. There were always the garden to be weeded and the stock to be fed. He drove and herded the cattle and sheep, worked at the wood-pile, and helped his father build rail fences. More enjoyable, though it sometimes became tedious, was the work of guarding the corn-fields against the pestering squirrels and crows. The foxes that dug the fish out of the corn hills and the wolves that attacked the sheep had to be trapped.

Probably the greatest fun came in the spring, when the sap ran, and the maple sugar camp was the scene of much busy employment. This was the Puritan boy's



FLAX HETCHEL

sole "camping out" experience. Maple sugar saved much expense in the buying of West India cane sugar, as also did wild honey from the great hollow trees that the boys learned to find by following the flight of bees.



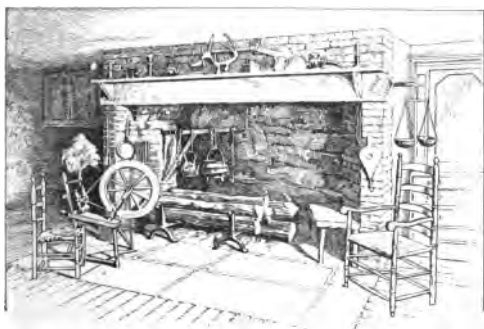
A MAPLE SUGAR CAMP

Another springtime occupation was the making of soap. The barrels of wood ashes were leached by having water soaked through them. At the bottom of each barrel was a hole through which the lye dripped. Mixed with grease and fat, this was "boiled down" in a huge kettle over a fire built out-of-doors. The product was good homemade soap, both hard and soft, for different household uses.

In the fall the cider mill was set going; at the same time barrels of apple sauce and apple butter were made for winter use. The pigs were killed and the sausages were stuffed.

Everyone has seen pictures of the old New England farmhouse, with its rambling wings, sloping roofs, and many gables. In the center was the huge chimney; the fireplace occupied much of one side of the living room.

Here the cooking was done and here the family gathered in daily worship. Around the fireplace, too, were carried on the many occupations that helped to feed and clothe the family. There was enough of such work to



NEW ENGLAND KITCHEN

keep all hands busy during the long winter evenings. The greater part of the clothing of both men and women was made of wool. This was first cleaned, then combed, and then spun into yarn. The girls could help in the spinning and the boys could wind the yarn. Cloth was then woven in the loom and was later fullled and dyed. The garments for the family were cut and made in the home.

Other fireside occupations for the boys were shelling corn, the making of brooms and wooden shoe pegs, and the setting of wire teeth in wool combs and of spikes in the flax hetchels. The men, on their part, cut out wooden bowls, spoons, and other dishes and utensils for use in the kitchen and on the table; they plaited baskets and chair seats, and mended scythes, rakes, flails, and other tools. They made the wooden handles of these implements

and the wooden teeth of rakes and harrows, hardening the latter in the fire. They also fashioned the ox-yokes that were used on every farm. Iron nails and chains were made at home forges. The New England farmers also made shingles, staves, and clapboards, both for their own use and for sale. Large quantities of these products were exported. In short, the small farm of colonial times was also a factory. Its many occupations gave to the young a training of the hands that went far to educate their minds and to make them in every respect strong men and women.

In many ways, quite different conditions of rural life were found in Virginia. The country was level, and the soil, though sandy in some places, was on the whole rich. The mountains were far from the coast, and the rivers afforded an easy way into the interior. Under these conditions the people spread out upon large plantations, instead of having only small farms such as were found in New England. But the greatest cause for the existence of the large plantation system was tobacco. This product was thought to be more sure to make a man rich than any other source of wealth in the colonies. A description of plantation methods will show why many of the planters did not become rich in anything but land and slaves.

In raising tobacco a seed-bed was started in the early spring; later, the young plants were set out from six to nine feet apart in each direction. When the plants were about one foot high they were topped and pruned, leaving only seven or eight leaves. After this, the field was gone over constantly, the ground between the rows becoming hard beaten paths; the weeds were kept down

by hoeing, the worms were picked off, and the suckers were cut. This was work that ignorant negroes could do as well as anyone; there was little to learn, no skill was needed, and the negroes were not harmed by the monotonous labor in a hot climate.

When the plants turned brown they were cut and laid on the ground over night. Next, they were carried to the tobacco shed and hung upon pegs or poles to dry for from four to six weeks. Later, they were again piled



ROLLING TOBACCO TO THE WHARF IN VIRGINIA

up to "sweat," and after the leaves were stripped from the stalk they were packed in hogsheads or bundled up in long rolls. The hogsheads contained from five hundred to fifteen hundred pounds of tobacco. When they were ready to go to the landing, the hogsheads were rolled by hand if the distance was not great; otherwise an axle was run through the center of the cask and a horse or an ox drew it along the road. If the planter lived back in the country, he might have to load his hogsheads upon a raft and thus carry them to the main stream and down to a landing, where they met a ship from England.

One slave could care for about three acres of tobacco, raising from one and one-half to three or four hogsheads.

A planter had to have at least twenty slaves if he wished to make it profitable to keep an overseer. Counting the timber and waste land, besides the fields planted to crops, a plantation had to have about fifty acres for each slave. The large plantations averaged perhaps 5000 acres; they often contained 15,000 or 20,000 and some had 40,000 or 50,000 acres; but, of course, not all the land was under cultivation. It has already been shown that the worn-out land was abandoned. The overseers were either paid a salary or given a certain part of the crop. In the latter case, it is easy to see why they urged the use of fresh land and so kept the plantations spreading.

There were few merchants and practically no towns in colonial Virginia. What were the reasons? Many mechanics and men of other occupations came there; but they soon saw the ease with which land could be obtained and tobacco raised, so they left their original trades and became farmers and planters. Since there were few good harbors on the coast, the ocean vessels came to the planters' wharves on the great rivers. The planter preferred to send his crop direct to an English merchant, thinking to save the profit that an American merchant would otherwise get. At the same time he sent to England a list of the goods that he wished in return. These were to be purchased by the merchant to whom the cargo of tobacco was sent. He acted as a middleman, selling the tobacco and buying the other goods on commission. This was not a very satisfactory way of doing business, so far as the planter was concerned. He had to take for his tobacco the price that was given him; he had to pay for his goods the prices that the London dealers asked. One can readily see the chances there were of his

being cheated. Very often his orders for goods came to more than the value of his crop. The result of this method of trading was that many Virginia planters were always in debt. They were constantly tempted to order large and expensive bills of fine garments, tableware, and furniture. In fact, the planter was usually extravagant, because it always seemed to him that his thousands of acres and scores of slaves must enable him to live in luxury.

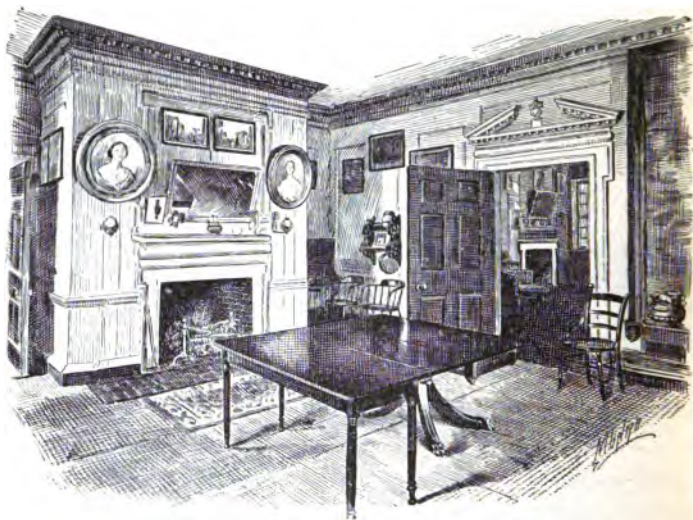


A SOUTHERN MANSION HOUSE

The planter's great dwelling, or mansion house, was situated upon the first rise of ground back from the river. The road to it ran from the river landing through groves and shrubbery to the portico at the front. The house might be either of frame or brick construction, but it usually had a large chimney at each end. Within was always one large room, or "hall," used as a dining and living room. There might be a small parlor, but usually all the other rooms were bed-rooms. Near the mansion house were numerous other buildings; the kitchen was a separate house. Then there were the slaves' quarters—rude log or plank shanties ranged in a row at the rear. Barns, stables, granaries, dairy house, malt

house, carpenter shop, and storehouses were scattered about. The vegetable and flower gardens, orchard, and brick oven were other features of the little settlement.

The plantation, like the small farm, was much more than a farmer's home. Here, too, manufacturing was a



A DINING-ROOM IN A VIRGINIA MANSION .
From "Some Colonial Mansions." Philadelphia, 1890.

prominent part of the daily life. There was a plantation carpenter, who built and repaired the houses and made and kept in order the farm implements. Often there were in addition the blacksmith, tailor, weaver, gardener, cooper, tanner, and shoemaker. All of these were usually indentured servants or slaves. The products of the Virginia plantation (and the same is true of those in Maryland and the Carolinas) included more than the corn, wheat, beef, mutton, bacon, fruit, vegetables,

butter, and cheese for the table. There were also hides, leather and shoes, iron-work and implements, woolen and linen cloth, stockings and garments of the coarser kind. The labor employed in these manufactures was unskilled, so the articles were for the most part crude. The planter bought in England all the finer goods that he used: cloth and garments for all his people but the slaves; and furniture, much of which was elegant, for his house. Besides, he spent much for jewelry, decorative articles, and books.

During the short winters the slaves were occupied with clearing new land; some of the timber was burned and the rest yielded lumber and shingles, and staves for barrels and hogsheads. It is not strange that the planter, if he watched all these occupations with care, must have been a very busy man; nor that his wife, who managed the household slaves and all the spinning, weaving, and dairy work, had her hands full to overflowing.

The typical planter of Virginia was very hospitable, and entertained, sometimes for weeks and months, almost any intelligent and well-mannered stranger who might come to his door. This was a pleasant way in which to break the monotony of plantation life. The planter was fond of fox-hunting and horse-racing; hence, he had the best horses in the colonies. He also hunted wild horses and cattle and trained his riding horse to dash at high speed through the open woods without injury to itself or to him.

Courtesy and fine manners were taught in the planter's home; many of the boys were sent to England for their education. But it is evident that they believed manual labor was only for the servants. Hard work with the

hands would lower the master or his family in the eyes of the servants and make it difficult to keep authority over them. Here in the South, then, were bred many strong men and women fit to become leaders and to command.

Were there small farms in Virginia? Yes, many, especially on the frontier. When the small farmer held land near the large plantation, he could not raise tobacco as cheaply as the planter; so, if his land was good, the latter often bought him out. If he then bought and remained on a strip of poor land, just making a bare existence, he soon lost ambition and reared his family in poverty and ignorance. He thus became a "poor white," and even the negroes looked down upon him. If he "went west," near the mountains, he had a better chance.

The reasons for the two very different types of farming in North and South are found, then, partly in the nature of the seacoast, the land, and the river systems, but chiefly in the nature of the crops. Tobacco, rice, and indigo required a kind of labor for which slaves were suited; they were money-making crops, and men were anxious to raise them on a large scale. On the other hand, the grains, flax, and hemp of the North required more skilled labor, but less constant attention while the crops were growing. In addition, these crops found ready markets near at home, for the most part, because a considerable portion of the people were engaged in other occupations besides farming. These conditions, together with the scarcity of labor and the high value of land, kept the farms of the North small.

Important results followed from the different conditions of life in North and South. In the northern region

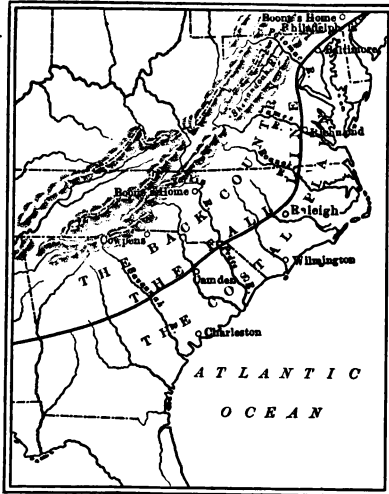
of small farms there grew up a feeling of equality among the farmers, while the plantation system of the South bred an aristocracy of large owners. Another effect is seen in the government of the two sections. In the North the people took part more largely in political affairs, and hence democratic practices prevailed; while in the South the masses followed the leadership of the prominent planters, among whom were some of the most intelligent and forceful men of colonial times.

CHAPTER VII

THE BACK COUNTRY

FROM the beginning of our history men had been moving westward to find new and cheap lands. Sometimes, following the river valleys, they first moved north,

as in the Connecticut Valley, which led the early settlers into New Hampshire and Vermont; or along the Hudson, until the rich valley of the Mohawk was found. In Pennsylvania the people followed the Schuylkill and Susquehanna Rivers and their tributaries that led into the valleys between the parallel mountain ranges.



COASTAL PLAIN, FALL LINE, AND BACK
COUNTRY OF THE SOUTH

South of Pennsylvania the mountains trend toward the southwest,

and the plain between the ocean and the mountains becomes wider. As one goes up the rivers that lead backward from the ocean, he finds a point in each where there are rapids or falls. Here the water tumbles over rocks that it cannot easily wear away. If all such points on the various rivers are connected, as is done in the map, we

have what is called the "fall line." Above this point the country becomes hilly, and large stretches of sandy soil are found, upon which are growths of pine trees. This region, often rough and sterile, is called the "pine barrens," or in Georgia and Alabama, the "wire grass" region. Still farther inland the country is rolling; the soil is better; beautiful open forests of hardwood trees grew there in colonial times. Where the land was wet, along the river courses, there were dense growths of tall cane, called canebrakes; where the country was open the ground was thickly covered with the wild pea-vine. Here was a rich region of pleasant climate and beautiful scenery. Whose should it be, and what kind of farm life and work would its people have?

We have seen how, in Virginia and the Carolinas, indentured servants and poor farmers were constantly going to the frontier. Many of them settled in the "back country" or uplands that have just been described. It is also true that some planters who saw here a chance to get immense tracts of land, and to hold them for a rise in prices, became land speculators in this region. But the greater part of the people who came to the back country in the later colonial period journeyed there from farther north. In Pennsylvania and Maryland immigration from Europe was rapid. When the best lands east of the mountains in these colonies were taken up, and the mountain valleys were once entered, it was easier to seek new lands by moving southwest than it was to cross the mountains and encounter the dangers of Indian attack. The story of one family in which there was a boy whose later life made him famous in American history illustrates this movement.

Daniel Boone was the son of an English Quaker, Squire Boone, who had come to America with his father in 1717. Squire Boone was a weaver by trade, but like many other mechanics in this new country, he bought land as soon as he had earned enough money from his trade. He first



DANIEL BOONE

had 250 acres located on a tributary of the Schuylkill in southeastern Pennsylvania, near the town of Reading. Here Daniel was born in 1754. His father added to the family income by work at blacksmithing, besides weaving, so we may guess that very little of this frontier farm was actually under cultivation. Squire Boone increased his land holdings from time to time and came to own a grazing tract some five

or six miles north of the farm in the foothills of the mountains.

To this tract the cattle were sent every spring, in charge of Daniel and his mother, who lived there in a cabin through the summer. It was Daniel's duty to drive the herd to the best feeding grounds and to watch them through the long summer days. At night they were shut in a pen, safe from danger. His mother made butter and cheese, storing them in the cool spring-house until autumn, when they were taken down to the village for sale. Such was the life of Daniel for several years after he reached the age of ten. With a natural love for the out-of-doors, he learned all nature's secrets that

a small boy could comprehend. He learned, too, all the Indian's knowledge of the hunt, the trail, and the camp.

When Daniel was sixteen, his father determined to take his wife and family of eleven children and seek new lands in the southwest, just as thousands of others were doing. With a canvas-covered mover's wagon, preceded by the father and boys on horses, and followed by the small herd of cattle, they passed down the mountain valley and crossed the Potomac at Harpers Ferry. They were now in the beautiful Shenandoah valley. Here Virginians and men from Pennsylvania and Maryland had been settling since 1732, and here the Boones are said to have stopped for a year. But they then pushed on, crossing the first mountain range to the east at one of its many gaps, finally coming out in the Yadkin country of North Carolina. Here was land in abundance, and the Boones located at Buffalo Lick.

Six years later, Daniel married and took land for himself a few miles north of his father's farm on Sugar Tree Creek. Here he built a rude log cabin, like that of all the pioneers of the time, and became a farmer. Raising enough corn and pumpkins, pork and beef, to supply a family was not a difficult task; but it was a far easier and pleasanter task for Daniel to hunt bears, deer, and buffaloes. Like other frontiersmen, he salted the skins and carried them on pack-horses to the nearest town, or even to the Atlantic coast cities. Cloth, hardware, and salt were bought and carried on the long trail back home. But this life was too monotonous for a young man so fond of adventure. Boone's gaze was ever turned westward across the mountain ranges, and there some years afterward he led the way as hunter, pioneer, and settler,

to the region known as Kentucky. In his later years he moved again and lived until his death in Missouri. It is of interest to know that his descendants continued the westward movement that he began and were among the first settlers in the Willamette valley of Oregon.

Instead of following the interesting life of Boone, this account should now return to the back country east of the Alleghany Mountains. Frequent mention has been made of the fact that the colonists let horses and cattle run wild in the forests. These increased in numbers very rapidly and became hardy and fleet-footed, able in some measure to defend themselves against wild animals. The upland furnished rich pasturage for the stock. Many an early comer to this region found herding a profitable business. Such a settler would select a tract where there was plenty of cane and pea-vine, and clear ground for his corn patch. Game was so plentiful that there was no lack of meat. Then the rancher, with his assistant cowboys, mounted on the swiftest ponies, would surround the wild droves and chase them into corrals, where they were branded.

They would then guard the herd, driving it from one place to another in search of new pasturage. Some herders got thousands of cattle in this way; not being able to count them, they estimated the number by the calves that were branded each year. From here the cattle and horses were driven to market in the coast towns, even as far north as Philadelphia.

This back country, then, was the first range and ranch district of our history; here were the first cowboys, able to lasso and brand the wildest steer and to subdue the most stubborn horse. Cowpens, where one of the famous

Revolutionary battles was fought, was the location of one of these centers for grazing and rounding up stock; and the patriot soldiers who won that battle against Carleton's forces were, many of them, settlers in the back country and the mountain valleys, who swarmed at the call of Morgan and other leaders to defend their frontier homes.

As more and more of the settlers like the Boone family came into this region, the cattle ranges were turned into farms, and herding was pushed farther west. The cattle were driven first into the mountain valleys, where the grass grew rank and sweet. Often the Indians were troublesome and made many raids upon the frontier posts and settlements. Hence the farmer's life was not only simple and rude, but dangerous as well.

The back country of the South in colonial times was a region of small farms and varied crops. Here were the same household industries that we have noted on farms and plantations farther east. The streams near the mountains furnished good water-power, and many grist and lumber mills were erected. There were few good roads leading out of this region. Those that ran north and brought the traveller to Baltimore and Philadelphia were more frequently used than those that ran to the seacoast cities, such as Charleston and Wilmington.

In short, the back country was very different from the large plantation country of tobacco, rice, and indigo, and was much more like the North, both in its farms and its people. However, a great change was to come about in the nature of its agriculture, when the cultivation of cotton began in the South and this became the chief crop of the upland region.

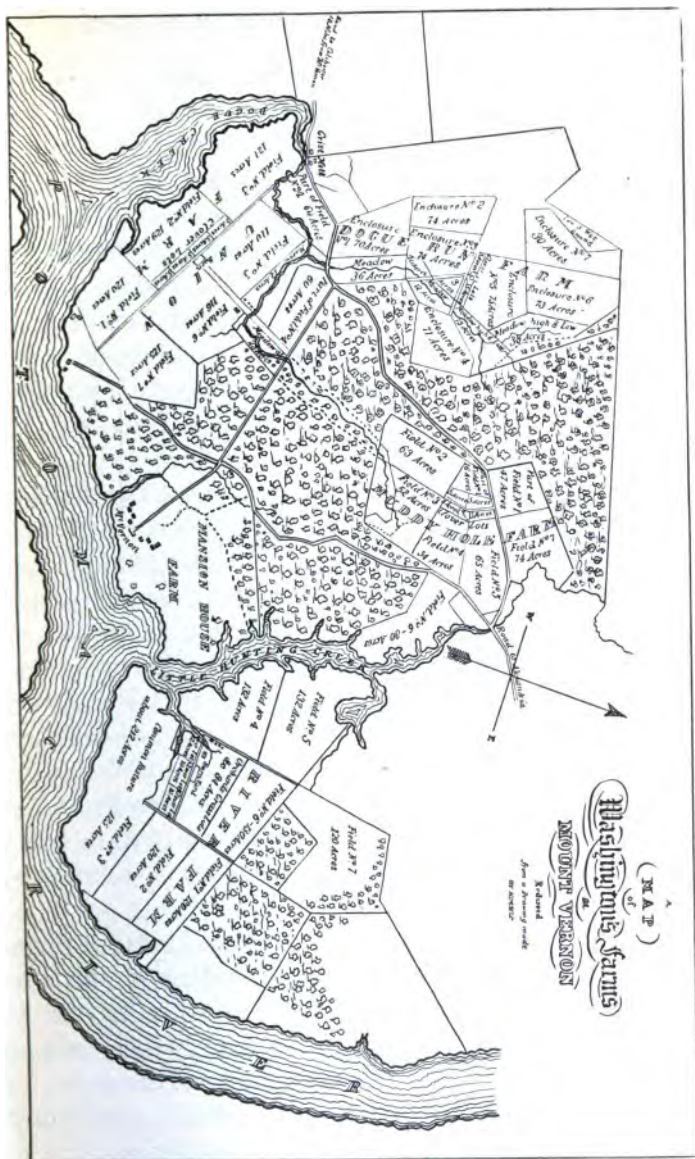
CHAPTER VIII

GEORGE WASHINGTON — FARMER¹

ALL who have studied American history know something about Washington as General and President, but much less about him as a farmer. To this business he gave strict attention at all times, whatever his other occupation. In the management of the farms that made up his plantation on the Potomac, he took great pleasure; and it was only his strong sense of duty and his devotion to the country that made him leave his home to accept those most responsible positions — Commander of the Army and President of the new Republic.

Concerning Mount Vernon, Washington said: "No estate in United America is more pleasantly situated than this. It lies in a high, dry, and healthy country, three hundred miles by water from the sea, and as you will see by the plan, on one of the finest rivers in the world." When he inherited this estate from his half-brother Lawrence, it covered about 2500 acres. He added to it, so that in 1793 it contained 10,000 acres. The map shows that it was composed of four farms, besides the "Mansion House Farm," upon which Washington's house stood. A large part of the estate was wooded. The various farms were divided into fields, and these were numbered and

¹ This chapter was in type before the author had the opportunity of seeing Paul Leland Haworth's excellent work, *George Washington: Farmer*.



accurately surveyed. There were 3260 acres under cultivation or in meadow, orchard, garden, or clover lots.

Each farm had a hired overseer, and on some if not all there were overseers' houses, besides barns, stables, etc. while near by stood the shanties for the slaves of that farm. During the long years of Washington's absence from home, as Colonel in the French and Indian War, as General in the Revolutionary War, and as President, he employed eight different managers for his estate. But the business of the estate was constantly in his mind, and he directed its affairs by correspondence as well as it could be done in that way.

When Washington was at home, he gave the strictest attention to his lands, crops, and stock. At seven o'clock in the morning he mounted his horse and frequently made a twenty-mile circuit of the various farms, consulting with the overseers and giving directions for the management of the estate. He kept exact account of every day's history of each of the fields — what work was going on, what crop was being planted or harvested, what stock he had and how it was being cared for, what new seeds or trees were being tried, besides the exact yield in bushels or pounds of each crop. And many were the hours late at night that he spent in writing the journal of all these details.

What, may be asked, were Washington's ideas of farming? He knew very well about the shiftless methods to be found everywhere in America. Of this matter he said: "The general custom has been to raise a crop of Indian corn (maize), which, according to the mode of cultivation, is a good preparation for wheat; after which the ground is respited (except from weeds, and every

trash that can contribute to its foulness) for about eighteen months; and so on, alternately, without any dressing, till the land is exhausted, when it is turned over, without being sown with grass-seeds, or reeds, or any method taken to restore it; and another piece is ruined in the same manner. No more cattle is raised than can be supported by lowland meadows, swamps, etc., and the tops and blades of Indian corn; as very few persons have attended to sowing grasses, and connecting cattle with their crops. Indian corn is the chief support of our laborers and horses. Our lands were originally very good; but use and abuse have made them quite otherwise."

Washington strongly condemned this method of farming. He saw that it had resulted in lowering the average crop of wheat in Virginia from thirty to eight or ten bushels per acre. He was a student of the best English writings upon agriculture, sending there for books and corresponding with the best authorities both in England and America. So he was thoroughly informed about rotation, fertilization, and the use of clover and root crops. He believed in a scientific treatment of the soil and worked hard to bring his managers and overseers to understand and to apply the best principles known at that time.

As the first means of keeping his lands from being worn out, Washington decided to grow less tobacco and corn and more wheat. Tobacco, he saw, was very hard on the soil, and of corn he decided to raise only the necessary supply. In the second place, he would have a regular rotation of crops, planned years ahead. Here is one such plan, covering a period of seven years: First year, corn and potatoes in alternate rows; planted in the fall

to wheat for the second year's crop; third year, buckwheat, plowed in for manure; fourth year, wheat; fifth, sixth, and seventh years, clover and grasses. This system was to be applied to the seven fields of one farm, and thus the various crops were to be kept rotating in the order mentioned. Another plan was this: First year, corn and potatoes; second, wheat; third, buckwheat; fourth, clover; fifth, wheat; sixth, buckwheat; seventh, clover.

Washington calculated in these and similar plans just how many days' work of plowing, cultivating, and harvesting were necessary for each field; also, what yield might be expected from each and how much would be the profit.

The most prominent idea in all of his plans was that of keeping his land in good condition. To accomplish this his farms must produce much manure, hence the care and increase of stock was a very important matter. This was very different from the usual method of farming at that time; but Washington's ideas represented advanced views that were gaining ground among intelligent farmers. He argues many times for intensive farming, upon the principle stated to his manager, to whom he wrote about a certain matter, "not to undertake in this, or in anything else, more than you can accomplish well: — recollecting always that a thing but half done is never done; — and well done, is, in a manner done for ever."¹

Moreover, Washington believed in keeping up the appearance of his estate. He says, "I should begrudge

¹ This and numerous other quotations are from *George Washington and Mt. Vernon*, Memoirs of the Long Island Historical Society, Vol. IV.

no reasonable expence that will contribute to the neatness of my Farms: — for nothing pleases me better than to see them in good order, and everything trim, handsome, and thriving about them.” But in this respect the conduct of his estate by several of the managers was a great disappointment. He found it impossible to keep up its fertility and appearance while he was absent. Upon his return home in 1797 he found “everything in a deranged and the buildings in a decaying state.” This was in spite of the fact that Washington required weekly reports from his manager, giving all details concerning the work on each field and the care of the stock. Each week, too, he wrote a long letter giving advice and directions, sometimes reproving, and again warning the manager against the mistakes that were constantly being made.

One principal source of trouble was the character of the overseers in charge of the five farms at Mount Vernon. He found his land “hard bound,” due to the “insufferable conduct” of his overseers. He writes to his manager, Mr. Pearce, to keep the overseers from running about too much. If any of them are found inattentive to their duties, he says, “admonish them in a calm but firm manner of the consequences. If this proves ineffectual, discharge them at any season of the year without scruple or hesitation, and do not pay them a copper.” It was very difficult to make the overseers give exact reports of their crops, stock, etc. Some of them had no authority over the slaves, and so got little work from them.

But the greatest difficulty encountered by Washington was in the character of slave labor. Some of his slaves had been inherited from his half-brother; others were

the property of Mrs. Washington. The two lots had intermarried and many children had resulted. Washington's treatment of his slaves was just and humane. When some complained that they had not enough meal to eat, he wrote, "My wish and desire is that they should have as much as they can eat without waste, and no more." Once, when a negro boy died, he wrote, "I hope every necessary care and attention was afforded him." On the other hand, he wished his slaves to be ruled with a firm hand. For instance, he once directed with regard to a runaway slave: "Let Abram get his deserts when taken, by way of example; but don't trust Crow [one of the overseers] to give it to him — he is swayed more by passion than by judgment in all his connections."

In spite of their good treatment, these slaves, like all others, proved to be a sore trial to their master. Washington said emphatically that "there are few Negroes who will work unless there be a constant eye on them — or will not slight it if there is not this eye." In the reports made by his managers there were constantly cases of slaves being absent from work on account of sickness. Concerning this he said: "I never wish my people to work when they are really sick, or unfit for it; on the contrary that all necessary care should be taken of them when they are so: — but if you do not examine into their complaints, they will lay by when no more ails them than ails those who stick to their business." Again: "my people (some of them) will lay up for a month, at the end of which no visible change in their countenance, nor the loss of an ounce of flesh, is discoverable; and their allowance of provision is going on as if nothing ailed them." Betty Davis, he noticed, was off duty two days of every

week; he declared her to be one of the most idle creatures upon earth, and also one of the most deceitful; "a more lazy, deceitful, and impudent huzzy, is not to be found in the United States than she is." And Betty was not the only offender of this character.

It was not only laziness, but also waste and theft, of which the slaves were guilty. If allowed, they would go from one task to another, merely "killing time"; perhaps driving a cart with little more of a load than a man could carry on his back. Washington complained that one-half his pork was spoiled for lack of proper attention in smoking, and he thought that he did not get more than a small part of the young pigs that were born. His horses were ridden at all hours of the night and sometimes foundered, or the mares were caused to lose their colts. Every product of the farms had to be kept under lock and key. Even then the slaves would steal when carrying from the fields to the granaries or from the storehouse to the kitchen. Some of these stolen goods they ate and some they carried off and sold to the neighbors or to the merchants at Alexandria.

Washington once said concerning his oats, "What by waste, mismanagement, or something worse, I have got of late very little from any of my overseers." Even his fish nets and the wool from the backs of dead sheep were stolen. When his standing timber was being cut by his neighbors, he wrote, "It is really shameful to be treated in the manner I am by people who take such liberties with my timber and wood during my absence." The negro women who spun yarn stole part of the wool; and those who made garments stole cloth.

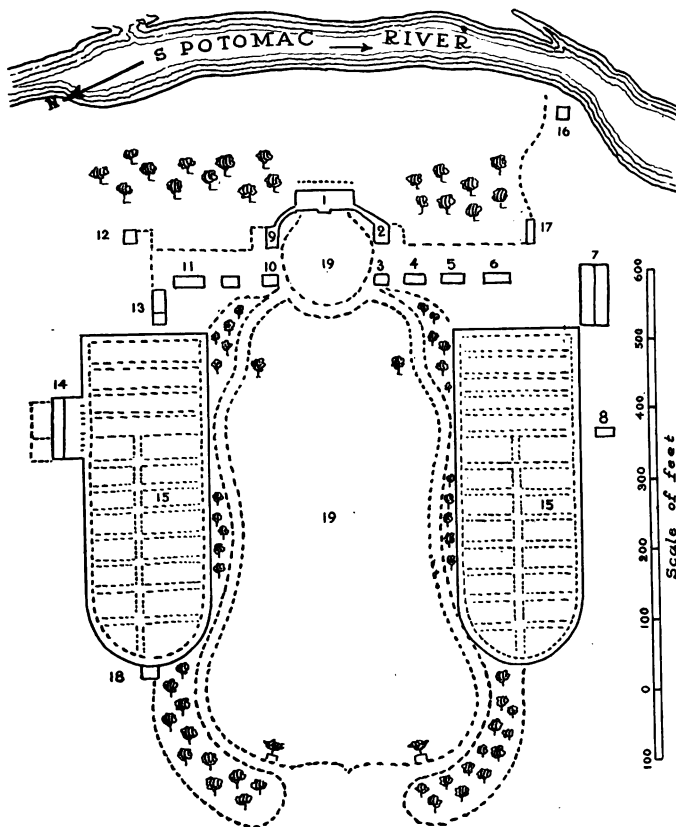
Washington had a gang of eight or ten negro carpenters

who were in charge of a drunken overseer. The lazy fellows wasted more time than they spent in work and were a constant annoyance to their master. Yet he would not discharge the overseer, for his family would certainly suffer from poverty.

Like many other planters of his time, Washington saw the wrong of slavery and wished that it did not exist. Writing to Robert Morris in 1786, he said, "I can only say, that there is not a man living, who wishes more sincerely than I do to see a plan adopted for the abolition of it." Again, he said, "I never mean, unless some particular circumstances shall compel me to it, to possess another slave by purchase, it being among my first wishes to see some plan adopted, by which slavery in this country may be abolished by law." He provided in his will for the emancipation of his slaves at the death of Mrs. Washington.

Washington put the whole matter of his agricultural policy into a few short statements. He said that these were his favorite objects: 1. To recover his land from its gullied and exhausted state — due to neglect. 2. To lay down all low and swampy land to grass. 3. To have clover lots enough for soiling work-horses and cattle, and for other purposes. 4. To substitute live for dead fences. 5. To give attention to stock, and their increase. 6. To look into the little as well as the great concerns of his farms. 7. To use every possible means of fertilizing his fields.

He showed his progressive ideas also in relation to farm machinery. He said to Pearce, "I am never sparing (with proper economy) in furnishing my farms with any and every kind of tool and implement that is calculated



- | | |
|-----------------------------------|------------------------|
| 1. Mansion House | 11. Spinning House |
| 2. Kitchen and Servants' Hall | 12. Blacksmith Shop |
| 3. Store House | 13. House for families |
| 4. Smoke House | 14. Hothouse |
| 5. Wash House | 15. Kitchen Gardens |
| 6. Coach House | 16. Spring House |
| 7. Double Coach House and Stables | 17. For manure |
| 8. Barn and Carpenter Shop | 18. School |
| 9. Lodgings for white servants | 19. Lawn |
| 10. Tailor's and shoemaker's shop | |

THE BUILDINGS AT MOUNT VERNON

This plan was made by an Englishman, Samuel Vaughn, who visited Mount Vernon in 1787.

to do good neat work." In more than one case he planned the making of his plows and he also had one sent to him from England.

Agricultural experiments were constantly in progress at Mount Vernon. In 1788 a German gardener was employed, and while President, Washington sent home a great variety of seeds and plants for trial. He gave exact directions as to how these were to be cared for. First, it was East India hemp and "a particular kind of oats." Then Jefferson, who was also a Virginia planter, sent to Mount Vernon a bag of "poccoon" or Illinois nut — the pecan; also, some French furze and saintfoin. Next, it was "four kinds of seeds sent him by a gentleman in England, some or all of which came from the East Indies"; then seeds of nankeen cotton. Five thousand plants of the white thorn were sent from London. He tried also different varieties of turnips; some chicory seed; Botany Bay grass seed; clove seed; new varieties of apples; seeds of the cucumber tree and the honey locust.

Washington tried in many ways to discover whether his methods of managing the plantation were the best. For instance, he ordered one hundred bushels of wheat taken to his mill, and the flour, bran, and middlings sold; another hundred bushels were sold without grinding. When the returns from each transaction came in, he found that it was more profitable to grind his wheat. The Mount Vernon "superfine" flour had the reputation of being as good as any ground in the colonies, and it is said that it was admitted to the ports of the West Indies without inspection. Again, Washington ordered that a bullock should be fattened on potatoes alone;

another on corn meal; and a third on the mixture of the two feeds. Thus he sought to find the best method of feeding.

However, the pains taken by the master of Mount Vernon to improve its cultivation by experiments resulted in disappointment. He said, "It would seem as if my blundering overseers would forever put it out of my power to ascertain facts from the accuracy of experiments."

Washington was very fond of trees. He took great care to see that no more trees than necessary should be cut; for, he said, "It is always in one's power to cut a tree down, — but time only can place them where one would have them, after the ground is stripped of them." To illustrate his interest in fruit trees and vines, one day's entry in his journal may be cited: "March 21, 1763. Grafted 40 cherrys, 12 Magnum Bonum Plums. Planted 4 nuts of the Mediterranean Paine. Set out 55 cuttings of the Medeira grape. Grafted or planted Spanish pears, Butter pears, Black Pear, Bergamy Pear, New Town Pippins."

Besides his slaves, Washington made use of indentured servants. Thus, in 1786, he bought the time of a Dutch family — man, wife, and child. The man was a ditcher, mower, etc.; and the wife was expected to spin, wash, and milk. The same year Ryan, a shoemaker, and Bowen, a tailor, came to Mount Vernon for three years' service, Washington having paid £12 for the time of each. The gardener's wife was expected to give out wool and flax to the spinners, and to keep account of the thread and yarn received from them; also to make linen cloth for the negroes. The hides of dead cattle were tanned

by "old man Jack;" "Mulatto Will" was kept busy making shoes. These were doubtless slaves. But a Scotchman was hired outright as an expert repair man, to keep in order the carts, plows, and other implements, as well as the spinning wheels and looms.

Fishing was an important industry on the Potomac frontage of this estate. When the fish ran in schools, in the spring, Washington ordered that seining should go on day and night. The fish was salted and packed for later use, and some was shipped.

Washington was particularly fond of fine stock, and he grieved greatly that his horses were abused, his lambs died uncared-for, and his cattle and sheep grew less valuable during his absence. He saw that for his farm work, mules were better than horses, being stronger, requiring less feed, and being better able to endure the abuse that all animals received at the hands of the negroes. In 1788 the King of Spain sent him two jacks, one of which died on the voyage across; and Lafayette sent him a jack and two jennets from the Island of Malta. Washington bred a fine grade of mules, some of which he used for his carriage. He gave directions to have twenty yoke of oxen broken for the plow; these were to be worked only on alternate days, and after they were eight years old were to be used for beef.

As on other plantations, there was not enough shelter for all the cattle, though Washington believed that there should be. The pigs ran in the woods, so Washington could not tell how many he had. He spoke of wishing to try the experiment of raising pigs in the sty. The cattle were kept in pens, which were moved from one field to another for the sake of the manure. Particular

attention was given at Mount Vernon to the breeding of sheep. In 1789 they yielded an average of four and one-half pounds of wool, but by 1794 this had fallen to half as much.

Like the other Virginia planters, Washington sold his tobacco in London. And like them, too, he seems sometimes to have been cheated both in the amount that he received for it and in the prices that he was made to pay for the goods he bought. Of the latter there was great variety: suits, hats, gloves, and sword belt for himself; linen, satin, ribbons, aprons, handkerchiefs, hose, satin shoes, and kid gloves for the women of the household; pins, "6 lb. perfumed powder," "3 lb. best Scotch snuff," pickles, cheese, tea, corks, raisins, almonds, sugar, soap, mustard, "hhd. of the best porter," "100 lb. white biscuit," for household use; for the farms there were seeds of various kinds, besides nails, spades, sickles, saws, and other hardware.

One is impressed with this great man's patience in the face of all his plantation perplexities and his endurance of annoyances during his absence from home. Many times his mind must have been weighed down with anxiety over the conduct of his affairs at Mount Vernon, at the very time when the awful troubles of the Revolution or the trials of his presidency were most heavy. We may imagine his mind turning, on wakeful nights, to wonder what would result from the carelessness, idleness, and waste always present at home. Perhaps it was after a blustering night full of such anxiety that he wrote to Pearce: "Make my people at the mansion house be careful about the fire; for it is no uncommon thing for them to be running from one house to another in cold windy

nights with sparks of fire flying, and dropping as they go along, without paying the least attention to the consequences." Those were the days before matches, and it was easier to borrow a brand from a neighboring fireplace than to use the flint and steel and tinder-box.

At the time of his death, Washington was one of the largest landowners in the United States. Besides the Mount Vernon estate, he had more than 40,000 acres located in various places in Virginia, Kentucky, Ohio, Pennsylvania, Maryland, and New York. These, with his town lots in Washington and Alexandria, made his estate worth about \$500,000 — one of the largest fortunes in America. Washington's experience as surveyor on the vast estate of Lord Fairfax, before the French and Indian War, gave him a chance to see the country west of the mountains. He had great faith in the future value of these lands, so he bought them in large tracts. After the French and Indian War, Virginia gave land warrants as bounties to her soldiers. Washington's share was 15,000 acres. Besides, he bought the bounty rights of other soldiers. In later life he grew tired of holding so much land and desired to sell it. He even wished to rent all the farms, except the mansion house farm of his Mount Vernon estate.

Washington was in correspondence with some of the leading agriculturists in England and when the British Agricultural Society was founded by his friend Sir John Sinclair, he was made an honorary member. In his last annual message to Congress, written in 1796, he urged that a similar National agricultural society should be founded in this country.

One who studies Washington as a farmer must feel that he showed here great intelligence. He was diligent and progressive. He was eager to learn of the newest and best methods; but at the same time he was careful and thorough. Had he been able to devote his entire time to farming, he might easily have been first in agriculture, as he was in war and in peace.

CHAPTER IX

FIRST IMPROVEMENTS IN AMERICAN AGRICULTURE

DURING the colonial period little progress was made in the direction of better farming. Less progress was made in America than in England, simply because in this



TIMOTHY

country it seemed less necessary to farm in a careful manner. However, as the winters in northern colonies were longer and more severe than those in England, the raising of hay for winter feeding was more necessary. Hence one improvement in colonial agriculture was made when some of the native grasses were cultivated. The most important of these was timothy. This grass received its name from Timothy Hanson, who, about 1720, took some of the seed from New York to the Carolinas.

As compared with the knowledge and methods used to-day, the agriculture of that time seems very backward. There was little use of fertilizers, little rotation of crops, and little care of stock. Superstitions about the phases of the moon and weather signs had much more influence upon farm management than did scientific knowledge. There was, in fact, no scientific knowledge of how plants grow and why they thrive or fail. There were very few

men interested in this subject. Among those few was Benjamin Franklin, who, though not a farmer, applied to this matter the intelligence and common sense for which he was noted. In 1749 he proposed that there should be agricultural education for young men. The leading authority upon the subject in America was Jared Eliot, grandson of that John Eliot who was missionary to the New England Indians in earlier times. He wrote the first book on agriculture that was published in this country (about 1750). At the close of the American Revolution there was not an agricultural paper in the United States. There were no agricultural societies; no fairs or exhibits were held; and no premiums were offered for excellent products.

As indicated in the previous chapter, Washington was, of course, interested in all such matters. In his last annual message he urged that Congress should appropriate money for national agricultural boards that would collect and spread information. He also recommended that money be appropriated by Congress to be given as premiums "to encourage and assist the spirit of discovery and improvement" in agriculture. Washington was interested in agriculture not only because he enjoyed his own estate, but also because he saw its importance to the nation as a whole. He said, "It will not be doubted that with reference either to individual or national welfare, agriculture is of primary importance."

The first agricultural societies in this country were formed at Charleston, South Carolina, in 1784, and at Philadelphia in 1785. Societies were formed in New York in 1791 and in Massachusetts in 1792. The society at Charleston gave premiums for various kinds of products

— the vine, merino sheep, figs, olive oil, and hops. It also carried on a small experiment farm. From the meetings, exhibits, and premiums of these societies came much good. They often held plowing matches that caused men to see the need not only for strong oxen, but also for well-shaped plows. This period accordingly brought the first improvements in plows.

The first agricultural journals regularly published were *The American Farmer*, issued at Baltimore in 1819, and *The Plow Boy*, issued at Albany the same year. *The New England Farmer* began at Boston in 1822, *The New York Farmer* at New York in 1827, and *The Southern Agriculturist* at Charleston in 1828.

This, too, was the time when the raising of blooded stock in America began. From England were brought the new lines of Hereford and Shorthorn cattle. Henry Clay was one of the first to import Hereford stock, bringing them to his farm in Kentucky in 1817. Thoroughbred horses were also imported from England. The Morgan stock of horses was founded in New England about the year 1800. In Pennsylvania were raised the great, strong Conestoga horses, used for drawing freight and movers' wagons across the mountains.

The greatest change of the times, however, came about in sheep raising. In colonial times most sheep were black; their wool did not need dyeing; and their average fleece was two or three pounds. Almost every farmer raised enough to furnish his family with homespun woolen cloth, but he was apt to kill and eat the best of his lambs. While the sheep ran in the woods the grade became poorer, rather than better. There were no woolen mills in America, chiefly because farming was

more profitable than manufacturing. But even small factories were kept down (after 1699) by a law of England that the colonists should not make woolen goods for shipment from one place to another. So, while the coarse woolens worn in the colonies were made in the homes of the farmers, the people bought great quantities of finer cloths from England.

When the Stamp Act was passed, in 1765, the angry colonists tried to spite the mother country by ceasing to buy her manufactured goods. They made agreements and formed societies for this purpose and to discourage the eating of mutton. Similar action was taken by colonial assemblies, some of which also gave bounties for the production of wool and woolen goods.

The refusal of the colonists to buy British goods resulted in the merchants and manufacturers in England demanding the repeal of the Stamp Act. It was therefore repealed in 1766. But when the Townshend Acts, levying more taxes, were passed (1767) and the quarrel grew bitter in the years that followed, more efforts were made to increase the number of sheep and to encourage the manufacture of woolen goods. After the Revolution, the Americans were glad to buy again the cheap manufactured products of England, so no very great improvement in the wool industry resulted. The English prohibited any person from taking their improved breeds of sheep out of that country, the penalty for doing so being that the offender lost his right hand. While some persons evaded this law, they were few in number.

Among those most interested in a better grade of sheep was George Washington, who had at this time 700 or

800 sheep on his estate. George Washington Parke Custis, grandson of Martha Washington, had an estate at Arlington, across the Potomac from the National capital. He took great pains in the improvement of his sheep. It was his custom to hold annual sheep shearings, to which the neighboring farmers and planters were invited. Premiums were given for the best sheep, and Custis entertained his guests under Washington's great war tent.

But the greatest improvement in American sheep was to come about by the importation of better breeds from Europe. The finest sheep in Europe were the merinos, raised in Spain. Here were great flocks on the estates of wealthy landlords. The Spanish government, in order to keep a monopoly on merino sheep, prohibited their exportation without the king's permission. But this permission had been granted in many cases, and merinos had been taken to France and to Saxony, where they were successfully raised.

Three merinos, it is said, were smuggled out of Spain and brought to Boston by a William Foster, in 1793. Having to return to Europe soon after, he left them with his friend Mr. Craigie of Cambridge. The latter knew nothing of the new breed of sheep and so killed and ate them. Some years after, Mr. Craigie is said to have paid \$1,000 for a fine merino ram. In 1799 two Frenchmen, Dupont de Nemours and Delessert, brought to their estates on the Hudson River a number of merino rams. Soon after, other sheep of this breed were brought to Massachusetts and Connecticut by Seth Adams and Colonel Humphreys. Adams later moved to Ohio, taking the first merinos west of the mountains. Still

later, a large flock was driven from Connecticut to Kentucky.

One of the most intelligent farmers of the country was Robert Livingston, who had a large estate on the Hudson River. Livingston will be remembered as a member of the committee that drew up the Declaration of Independence. He was Chancellor of New York State and it was he who administered the oath of office to President Washington when he was inaugurated in 1789. President Jefferson appointed Livingston minister to France, and it was he, with the aid of Monroe, who brought about the purchase of Louisiana. In 1802, Livingston had two pairs of merinos shipped to his estate from France. These came from Rambouillet, near Paris, where the King of France, Louis XVI, had a government farm. Here he kept a great flock of merinos from which the people of France were improving the grade of their sheep. Livingston also bought sheep from the flock of M. Delessert, which was sold about this time.

After his return home, Livingston talked and wrote about the improvement of sheep and thus aroused much interest in the subject. In 1809 he wrote a pamphlet entitled "An Essay on Sheep." The state of New York offered a premium of \$50 to any person who brought a merino ram into a county where there was none. It also lent \$5000 to a man who established a woolen factory at Poughkeepsie and offered a reward of \$150 for the best two hundred yards of woolen cloth made in the state. A woolen manufacturer named Elkanah Watson bought a pair of Livingston's merinos and exhibited them at a fair held at Pittsfield, Massachusetts, in 1810. This aroused so much interest that the next year there was founded

the Berkshire Agricultural Society, which had great influence in stimulating agricultural improvement in western New England.

Strange to say, it was a great war in Europe that made possible the largest importations of merinos into this country. It came about in this way. Louis XVI of France was a despot, and there was a great revolution directed against his government, beginning in 1789, the same year that Washington was inaugurated. This French Revolution went on until Louis and his wife, Marie Antoinette, besides thousands of the nobility of France, lost their heads under the guillotine. Then arose a great military leader, Napoleon Bonaparte, who used the army to get control of the government. It was Napoleon's ambition to conquer the other countries surrounding France. Spain was one of these. The French armies invaded Spain in 1801 and fought many battles. One can easily imagine that the hungry soldiers took pleasure in eating and driving away many thousands of the fine merino sheep of which the Spanish people were so proud. In vain the Spanish government tried to stop their exportation. Great flocks were driven to Portugal and shipped from there to the other countries of Europe. George III, King of England, caused some to be taken to that country.

When Napoleon set up a new government in Spain, the officers, in order to get money, seized the estates of rich landlords who had fought the French. Their flocks of merinos were sold and thousands were brought to America. Thomas Jefferson and James Madison each got a pair of these sheep for their estates in Virginia. Jefferson had a plan for distributing free one ram to each

county in Virginia. He also improved the breed of shepherd dogs.

It may be said, then, that the forty years following the American Revolution saw some hopeful signs of improvement in our agriculture. Leading men were beginning to think and write upon the best methods, societies were formed, papers were published, and the value of high grade stock began to be appreciated.

CHAPTER X

PIONEER FARMERS OF THE WEST

IN colonial times, the Alleghany mountain ranges were covered with forests and a dense undergrowth of brambles, shrubs, and vines. When the westward-moving settlers passed through the gaps of the Blue Ridge, instead



VIEW IN THE ALLEGHANY MOUNTAINS

of continuing straight west they went southwest between the ranges. There were no roads over the mountains, only Indian trails. In many places it was impossible for a horse to push through the interlacing branches of the dense mountain forests.

The first English colonists who visited the country beyond the mountains were hunters and traders in furs.

They returned to the coast and told of wonderfully rich lands that stretched away to the Mississippi River. From this region the French were driven by the last French and Indian war (1763). In the colonies there were plenty of sturdy, restless young men, eager for adventure and anxious to build for themselves new homes in the wilderness. Some had been indentured servants; others were sons in large families who had to make their own way in the world; many were from the Scotch-Irish settlements in Pennsylvania, Maryland, and Virginia.

One of those, as we have seen, who led the way to the promised land beyond the mountains was Daniel Boone, who was fitted for this task both by his character and by his experience since boyhood. Directly west of Boone's home on the Yadkin, and just beyond the first range of mountains, lay a backwoods settlement known as Watauga, situated on the headwaters of the Holston River, a tributary of the Tennessee. This was a farming community

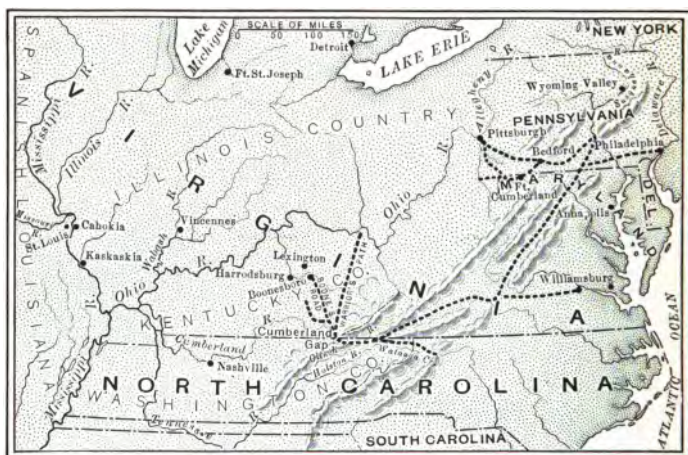
such as was described in the chapter upon the back country. From Watauga, Boone and his companions followed



CUMBERLAND GAP

the buffalo path and Indian trail that led through the valleys and along the mountain sides and that finally passed by way of Cumberland Gap across the

last range and thence out upon the land that we know as Kentucky. This was a beautiful region. Great trees towered toward the sun, and where they stood thickly there was little undergrowth. Grape-vines climbed the straight trunks of oaks, chestnuts, walnuts, and sycamores and then swung from tree to tree in graceful festoons. Many streams ran from the mountain sides, and where



MOUNTAIN TRAILS AND THE WESTERN COUNTRY

they passed through level country they were bordered by stretches of canebrake.

This was to be the home of the first American farmers beyond the mountain ranges. Here were no Indian villages, but the tribes of the country north of the Ohio River and those who lived farther south often sent hunting and war parties through Kentucky. When hostile bands met, there was sure to be a struggle, and so this region became known as the "dark and bloody ground."

Boone first travelled through the Kentucky forests in

1769, and within ten years after that time several small settlements had been made by adventurous Americans. Among these were Boonesboro, Harrodsburg, and Lexington, the last named after the town in Massachusetts where the first battle of the American Revolution was fought (1775). In some cases the log cabins of the settlers were built facing each other in the form of a rectangle, so that their backs formed a solid wall. Or, if there were gaps between them, these were filled by log palisades. At the corners were square blockhouses, projecting beyond the lines of cabins. The blockhouses had overhanging second stories, and loopholes through which the enemy could be watched and fired upon. The people lived in the cabins of these "forts" or "stations," or near by, and their fields were within a short distance. Often, in times of danger, the men had to take their guns into the fields where they worked, and sometimes a sentry watched for the Indian war party that might come at any time.



A FRONTIER SETTLEMENT — BOONESBORO

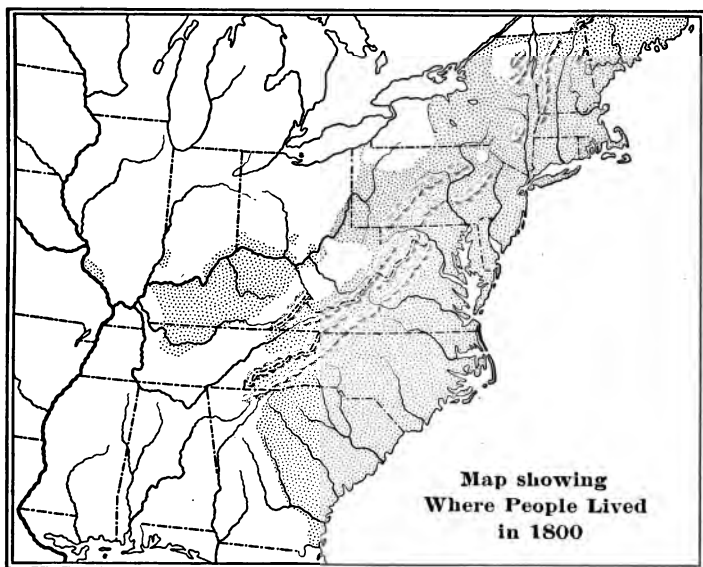
In 1775 the people of the Kentucky settlements held a convention at Boonesboro. Here laws were made; among them was one for preserving the breed of horses, and another for preserving the "range" — the vacant land where the cattle roamed.

Students of American history will remember that George Rogers Clark, a surveyor, lived in Kentucky at this time and that, at the outbreak of the Revolution, western Indians were incited by British officers to attack the Kentucky settlements. Clark saw how this might be prevented if the old French posts north of the Ohio River were taken from the British. Clark captured Kaskaskia and Vincennes, and thus not only protected the western farmers during the war, but also made it more certain that the country north of the Ohio should belong to the United States when the struggle was over.

It was not until some years after the Revolution that Americans made settlements in that region. But, once begun, the occupation of its fertile lands took place very rapidly. By the year 1800, along the Ohio and its tributary streams, were thousands of "clearings," where Western farmers were making homes in this new land. The map shows where the people lived whose life and agriculture are now to be described. It also shows the routes by which they came to the West. Why should they have left the safe and comfortable life of the East to face all the dangers and hardships of the journey across the mountains and the life in the forest clearings? Surely they must have been men and women of faith and courage.

It has been said that east of the mountains the farmers were cultivating the soil without enriching it, and wearing out one field after another. Naturally, as settlement approached the mountains, the price of land became higher. Many who desired fresh land went beyond the mountains rather than pay the high price for land in the East. They might have remained to work as hired

laborers or as renters of farms. But everywhere among these people we find a strong desire to own their own farms. When this became more difficult in the East,



Notice that the Western settlers are mainly south of the Ohio River.

men took their families to face the certain dangers of the western wilderness.

Ownership of a farm meant *independence*; it gave the owner a feeling of *equality* with every other man; it opened the way of *opportunity* for himself and for his children. Nowhere in America, where new land always lay to the west, would men consent to become as the peasants of Europe — dependent upon great landlords, regarded as a lower class of society, and shut out from the chance to improve and advance in wealth, education,

and social standing. Here lie the motives that sent men first across the Alleghanies, and then still westward across the Mississippi and beyond to the Pacific Ocean.

The story of this westward movement may well be told in connection with our agricultural history, since nearly all the early pioneers were farmers, and but for them there would have been little reason for the westward movement of merchants, manufacturers, and men of other occupations.

How did the Western settler travel to his new home? No wagon could cross the mountains in those early days, so they were obliged to go on foot or on horseback until, in the course of time, the trails were smoothed and widened. Some pushed small hand-carts before them, laden with their goods. When the roads were made passable, through Pennsylvania and up the Potomac, the covered wagon, costing perhaps \$40 or \$50, was the regular mode of conveyance. If it reached Pittsburgh without overturning, the travelers were fortunate.

Several families with wagons went in a group, and when evening came they camped by the roadside, where they visited after supper, laughing over the adventures and hardships of the journey. Sometimes bands of movers with long pack-trains of horses filed along the valleys south of Pennsylvania and Maryland until they reached Watauga; and from here they passed by the "Wilderness Road" through Cumberland Gap into Kentucky. The distance from Philadelphia to Louisville by this route was about 825 miles.

When the Ohio River was reached, or the Tennessee River in the south, the journey was quite apt to be continued by water. The single traveller in search of a

location to which he would later bring his family might go down the river in a canoe or in a pirogue—a hollowed-out log. Others took their chances of wreck and of Indian attack on a raft. But most of those who moved goods and families did so in a kind of flatboat known as an “ark.” This was from thirty to fifty feet in length and ten or fifteen feet wide. It was roofed over,



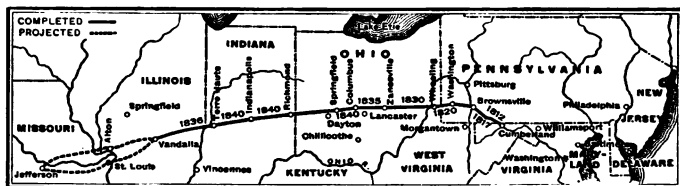
A FLATBOAT

except at one end. At both prow and stern were oarsmen to guide the craft away from logs and sandbars, keeping it in the current, where it floated at the rate of a few miles an hour.

Leaving the Ohio River at some convenient point, the travellers went overland to their new location, or up some smaller stream into Kentucky on the south or Ohio on the north. For this purpose a keel boat was used, long and narrow and propelled against the current by men with poles.

At some times the numbers of those who thus travelled westward were larger than at others. After the Revolution, hard times in the East led many to seek their for-

tunes in the West. So, too, at the time of the Embargo (1807-9) and the War of 1812, when Eastern farmers had less sale abroad than formerly for their products, thousands took this way of finding a better living. Soon the United States government saw the necessity of making



ROUTE OF THE NATIONAL ROAD, 1812-1840

the means of getting to the West more convenient, and began in 1811 to build the National or Cumberland Road. This had a wide road-bed, covered with stone, and was gradually built westward from Fort Cumberland in western Maryland to Wheeling, and thence through central Ohio and Indiana into Illinois. Meanwhile, the steamboat had been invented and men began to use it on the Ohio River (1811); and thus the number of movers to the West was greatly increased.

Arrived at his destination, the pioneer farmer built a cabin and then cleared enough land for the first year's crop. Perhaps a "half-faced camp" was all he could build the first season. This was merely three sides of a cabin, over which there was a roof of brush or thatch. It was in such a cabin that the boy Abraham



A WESTERN SETTLEMENT

Lincoln spent the first winter after his father moved from Kentucky to Indiana (1816-17). But usually there were neighbors who were glad to help the newcomers build a more comfortable dwelling. When they gathered for a "raising," the women and children came also and brought an abundance of provisions, so that they might have a feast and a jolly time at the end of the day.

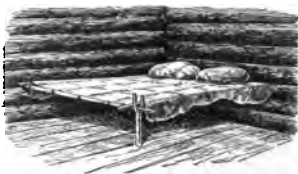
The assembled company of men was divided into groups, each for a particular part of the work. One party cut down the trees, another cut them into proper lengths, another split rough boards, while others raised the walls of the log cabin. First, two logs, perhaps twenty-four or thirty feet long, were laid on the level ground parallel to each other, and about twenty feet apart. Near both ends of the logs notches were cut. Next, two shorter logs had their under sides notched, and were laid across the first two, forming the ends. Then other logs were laid upon the first, being notched so that they fitted quite closely to them. So the walls would rise until they were six or seven feet high, when the end logs would be made shorter in each tier, until the side logs came together in a ridge at the top. The roof was now covered with short boards, several inches in width, that had been split from straight-grained trunks. Over these rude shingles poles were fastened by pegs, to hold them down; these were called weight poles.

The door and windows were then cut out of the sides of the cabin. A rough plank door was hung on leather hinges. It had a wooden latch on the inside which could be lifted by a string that passed outside through a hole. When the latchstring was drawn in, the door could not be opened from the outside; hence the familiar expres-

sion of western hospitality: "Our latchstring always hangs out for you."

Next, the chimney was built. An opening was cut in the back wall of the cabin, several feet wide and three or four feet high. Here small logs were built up outside the cabin to the height of the fire-place; above this the chimney was gradually made narrower. It was usually lined on the inside with stones, laid in mud mortar, and above these the sticks that formed the upper part of the chimney were thickly plastered with mud, both inside and outside. The broad hearth was either stone or hardened clay. The chinks in the cabin walls were filled first by strips of wood driven in between the logs where there were gaps, and then by being plastered with clay. Later, perhaps, the settler could afford to fasten clapboards by means of pegs on the inside walls of his cabin.

The ground might serve for a floor, but in the better cabins small logs were smoothed on one or both sides and laid close together to form a "puncheon" floor. For ceiling, saplings were run across from one wall to the other, and upon these clapboards were laid, overlapping each other. A series of



THE BED IN A LOG CABIN

pegs driven into the side wall was the ladder by which boys climbed to the loft at night. The family bed was made by driving a post into the ground near one corner of the cabin. From holes in this, poles were extended to the walls in both directions; across them was laid a platform of boards upon which a mattress of corn husks or a feather bed was laid.

If the company of house-raisers was large enough, such a cabin could be finished in a day; five or six men could accomplish the work in a few days. The settlers were glad to help one another and even made their contributions of food, poultry, calves, and pigs to help their new neighbors get a start.

Since the settler could bring little food with him, it was necessary to raise a crop as soon as possible. The Indian method of killing trees and planting a



A PIONEER HOME IN KENTUCKY

crop of corn was the custom followed in the West. Sometimes the dead trees caught fire and burned for days. Then there was great danger that the dead grass might carry the fire to the fences, stacks, and buildings. When the settler wished to rid his field of trees entirely, he invited his neighbors to a "log-rolling." With horses and oxen the logs and brush were rolled into huge piles and then burned. The ashes resulting from such fires were quite valuable. They were leached, and the lye was boiled down until nothing but a gray sediment remained. This was "potash" or "pearl ash" and was shipped east for the manufacture of soap.

It may be asked, how did the settler get his land? In many cases he simply took it, there being no one to hinder. Blazing marks upon a few trees about the tract he desired gave him a "tomahawk claim." Planting a little field of corn also gave him a claim to the land. However, the settler might easily get a grant before he started West. If he had been a Revolutionary soldier, he

was entitled to a bounty in the form of land; or, he might buy the land warrants of former soldiers. Speculators bought much land in this way and then sold it to settlers; but often they sold what did not belong to them. The



BLAZED BOUNDARY THROUGH THE
WOODS

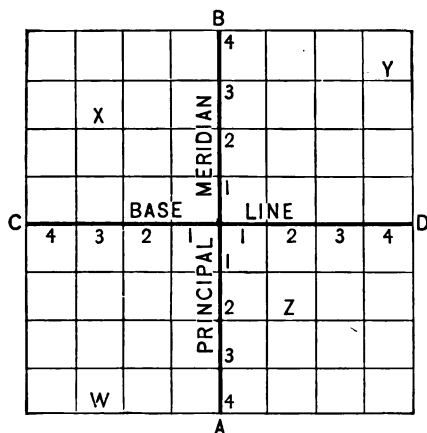
state of Virginia was very liberal with its lands in what is now Kentucky, which was until 1791 a part of Virginia. Each settler there was entitled to four hundred acres for the very small fee of ten dollars. Later, if he wished, one thousand acres would be

added to this amount upon payment of \$40 for each one hundred acres. Since the boundaries of the lands thus granted in Kentucky were not described, many disputes arose, some of them leading to bloodshed.

Histories of the United States tell about the claims made by some of the States upon land west of the mountains, and how, after the Revolution, they ceded this to the general government. The latter began at once disposing of its great domain at very reasonable prices. A great land company known as the Ohio Company of Associates bought 1,500,000 acres in 1787 for eight or nine cents an acre. Upon this tract a body of settlers established Marietta, the first American town north of the Ohio River.

According to the land law passed by Congress in 1785, a person could buy a tract of not less than 640 acres at one dollar an acre. Since few could afford to buy such large tracts, the law was changed in 1800 so that one might purchase 320 acres or more at two dollars an acre. Under

this law the purchaser need pay only one-fourth of the cost in cash and the rest in three annual payments.



I. X is township 3 north in range 3 west
 Y " " 4 " " 4 east
 Z " " 2 south " " 2 "
 W " " 4 " " 3 west.

6	5	4	3	2	1
7	8 ^a	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

III. A Township Showing Sections. (36 square miles.) Suppose this to be township X in diagram I. Then the section named a is section 8 of township 3 north in range 3 west.

Because they could get land on credit, many farmers bought more than they could pay for, so they mortgaged their farms, or else let the land go back to the government. By another law (1820), made to favor the poor man, any person was allowed to buy eighty or more acres at \$1.25 per acre.

40 acres	NE $\frac{1}{4}$ NW $\frac{1}{4}$	N $\frac{1}{2}$	NE $\frac{1}{4}$
8 $\frac{1}{4}$ 80 acres	NW $\frac{1}{4}$		SE $\frac{1}{4}$ NE $\frac{1}{4}$ 40 acres
100 acres	SW $\frac{1}{4}$		SE $\frac{1}{4}$

IV. A Section (640 acres)
 Suppose this to be section a of diagram III.

Then the 160 acres in the lower right-hand corner is the southeast $\frac{1}{4}$ of section 8 of township 3 north in range 3 west. The 40 acres marked NE $\frac{1}{4}$ NW $\frac{1}{4}$ is the north-east $\frac{1}{4}$ of the northwest $\frac{1}{4}$ of section 8 of township 3 north in range 3 west.

This must be paid in cash. It may be seen, then, that very few persons were kept from starting the life of a Western farmer because of the high cost of land. Indeed, if he was industrious, the settler's crops would pay for his land in two or three years.

In order to make the location of land easy, and to prevent disputes over farm boundaries, the government put into operation its system of rectangular survey that is still in use throughout the West.¹ Land offices were opened at different points in the West and at these, by examining the maps, the land that a man desired could be located and purchased.

The early settlers in this part of the West found the land covered with forest. Beneath the trees was a rich, black loam. No richer soil could be desired. Good crops of corn, hemp, flax, and tobacco were grown, and also crops of cotton and indigo. The yield of corn was often as much as sixty bushels, of oats fifty bushels, and of barley forty bushels per acre. Every farmer had his orchard, large or small. Peach and pear trees grew rapidly, and the dried fruit furnished a part of the settler's winter food.

The plow of the Western farmer of this period was that of the wooden moldboard and iron share. He used a triangular harrow, instead of an oblong one, since it was less liable to catch on the stumps with which his fields abounded. His wheat was threshed with a flail, at the rate of from eight to sixteen bushels a day; on many farms there was an out-door threshing floor of hard

¹ For description of this system, illustrated by diagrams, see Dunn's *The Community and the Citizen*, pp. 49-51, James and Sanford, *Our Government*, pp. 171-173. *Government in State and Nation*, pp. 280-282.

earth. This was shaped like a very small running track, the inside circle being fifteen feet or so in diameter, and around this track oxen or horses were driven. After the grain was tramped out in this way, the straw was removed; then the grain was winnowed. On a windy day, tossing it in the air would cause the chaff to be blown away.



FANNING AWAY CHAFF

Frequently, while one man sifted it through a sieve, two others waved a sheet in such a way as to make a breeze that carried off the chaff.

The corn, after being husked, was shelled by hand on winter evenings by being rubbed upon the edge of a shovel that was placed across a tub. It was then pounded in a mortar—the hollowed-out end of a stump. The pestle might be worked by hand entirely, or it might be suspended from the end of a long pole that pulled it up after each downward stroke. In case the



GRINDING CORN ON THE FRONTIER

corn was still soft, it was grated upon a piece of tin through which holes had been punched by a nail. It was often ground in a hand-mill consisting of

two stones, the upper one having a handle by means of which it was turned upon the lower stone.

Usually each farm had its cider mill, to which the apples were brought in the fall. There was also the cheese-press over which a log was laid with a weight upon one end.

In the first years of the new Western farm, wild game supplied much food for the family. There was more venison and bear's meat than beef or pork. Wild turkeys were more abundant than chickens, and in the spring and fall pigeons flew in flocks that darkened the sky. When such flocks alighted they sometimes broke the branches of the trees by their weight. In the forests where they nested, the farmers sometimes beat their nests to the ground with long poles and then turned in the swine to feed upon the eggs and young pigeons. At other times they fastened a decoy pigeon to a long pole that was arranged in a slanting position; when large numbers had alighted upon the pole, a hunter, standing at one end could slaughter all at one discharge of his gun. Such merciless and wasteful practices have resulted in the extinction of the wild pigeon.

Many settlers brought a cow or a few pigs and chickens. These increased rapidly from the beginning. The pigs ran in the forest and fed well upon acorns. The farmer kept his ownership in them by branding them or marking their ears and by occasionally throwing out some corn for which they would come back. The cattle found the richest meadows of grass and cane. They also ran loose and were branded. If the milch cows were fed they would bring back the herd at night. Often they were given salt at a certain place, to which they would return regu-

larly. At first no hay was cut for winter feed. It then became necessary in the early spring to drive the cattle to the woods, where trees were felled in order that they might browse upon the buds and tender shoots. Slippery elm, white elm, and the pig-nut, or white hickory, gave the best feed of this sort. It was not easy to keep sheep, on account of the wolves and panthers.

So abundant were the crops in these early years that the pioneer farmer could make a living for his family by working one-half the time. Indeed, he spent a large portion of his time upon such work as clearing fields, building fences, and erecting buildings. What should he do with the surplus of grain, tobacco, and live-stock? The way back to the markets of the cities in the East was long and difficult and there were no good roads; so there was scarcely a product of the West that could be taken overland and sold at a profit in the East. Much of the corn was therefore made into whisky, or fed to pigs and cattle which were driven to markets across the mountains.

The easiest way out of the West was down the Ohio River to the Mississippi and thence to New Orleans. Here lived many French and Spanish people, and here came the ships that carried freight to the West Indies and to the Atlantic coast cities. So the western farmers made salt beef, bacon, and hams, and loaded these, together with corn, tobacco, and skins, upon huge flatboats. (It will be remembered that in 1828 Abraham Lincoln made such a trip with a flatboat to New Orleans.) Arrived at New Orleans, the boats could be broken up and sold for lumber. A horse could be bought with a

part of the proceeds and the journey home thus be made overland to Ohio or Kentucky.

Traders soon found it a profitable business to collect these products and carry them to the Southern markets. They used long keel boats in which they could pole a cargo back against the current of the Mississippi. This is one way in which the Westerners got supplies of goods



SCENE ON THE OHIO RIVER
The main highway of the early West.

that they could not raise or make. One of the most difficult things for the farmer to get was salt; it was sometimes sold for several dollars a bushel. Salt was brought from New York State or made at the salt springs in Kentucky, where the water was evaporated in huge tanks.

The Western settlers had little money to use in trade; instead, articles such as corn, whisky, and skins passed as money. Frequently, silver dollars were cut into halves and quarters for use as change.

The price of labor was so high that few farmers could afford to hire field hands; at the same time those who worked for wages could earn enough in a few years to

start farming for themselves. In Kentucky and Tennessee slavery went along with the settlers, though at first slaves were few in number. North of the Ohio River slavery was prohibited by the Ordinance of 1787; hence most of those who settled there, even those from the South, were opposed to it. Efforts were made by those who favored the system to have slavery made legal in Ohio, Indiana, and Illinois, but they were unsuccessful.

Life on a frontier farm in the Ohio River valley had plenty of hard labor and homely pleasures. Without any of the improved farm machinery of our times, the work required mainly strength and patience. The long winter evenings



COONSKIN

were full of employment for busy fingers. Clothing was made at first from deer skins and buffalo wool; later from flax, hemp, and cotton raised on the farm. Sometimes, before the crops were plentiful, the fiber of the wild nettle was used. Linsey-woolsey, a mixture of linen and cotton, was the favorite cloth. It was spun and woven at home; the loom generally stood under the porch roof or in a lean-to at the rear of the house. For dyeing, the bark of the hickory or the butternut made good coloring matter.

Cooking was done in the big fireplace, where pots and kettles hung on the cranes. "Johnnycake" was baked on a board in front of the fire. The Dutch oven was common — a three-legged iron pot with a flat bottom,

around which hot coals and ashes were piled. Often there were bake-ovens built outside the house. If brick were not to be had for this purpose, stones and baked clay were used. In such an oven a fire was built and afterward scraped out. The loaves were then put into the hot oven. Kitchen and table utensils were mainly of wood and pewter.

When farms were scattered, life became lonely and monotonous; the people therefore took advantage of every possible occasion to have social gatherings. House-raising and log-rollings gave opportunity for such meetings. The women met in sewing and quilting bees and apple-parings; the men came for the evening meal and remained for the country dance. The husking-bee was the most exciting of these events. The long pile of corn was divided equally between two leaders who first "chose sides" for the contest. Then the men fell to the work with a will, each side determined to finish its portion first. Sometimes the rivalry ran into rough play and even fighting; but the spirit of good nature prevailed at the supper that had been prepared in the meantime by the women.

To these "frolics" were added, in later years, the spelling matches and singing schools, attended by both old and young. The coming of the backwoods "circuit rider" to hold a religious service in some log cabin or in the schoolhouse was an event of importance. The summer "camp meetings" were attended by hundreds of families, and here a chance was given for those who had forgotten the ways of civilized life in the midst of the rough frontier conditions to be "converted" and to return to better ways. The preaching, singing, and

praying were all done by main strength, both of voice and of muscle.

The frontier farmer boy had no lack of occupation. He split the kindling and the wood for the fireplace and gathered the chips used for lighting the cabin when tallow dips were scarce. He fed and drove the cows, but let his sister do the milking. He took part in the work of washing and shearing the sheep. He helped in churning and soap-making, and ran the melted tallow into the tin candle-molds. He looked forward to butchering-day as to a celebration. In the fall he chopped the sausage meat and the various ingredients of mince pies. On stormy days and winter evenings he might help his mother clean and card the wool, wind the yarn, and hetchel flax. Later she might call upon him for help in dyeing the homespun and bleaching the linen.

The boy was useful to his father when he searched the woods for good trees from which special articles were to be made, such as ax-helves and ox-yokes. From hickory saplings he could make splint brooms and cut out the splints used in making chair bottoms and baskets. He guarded the cornfields from squirrels and crows and set traps for wolves. He went on horseback to the grist mill, which was generally some miles away, and waited there for his turn to have his sack of corn ground into meal. Along with these duties were some pleasures, such as going nutting and berrying and hunting for grapes. Bee hunting gave its rich reward in the hollow trunk full of honey. "Sugaring off" time in the spring was a special time of delight, though it brought its tasks in the making of wooden spouts, the carrying of buckets of sap and water, and the tending of fires.

There were disagreeable features of life on the frontier. Everywhere people suffered much from fever and ague, and mosquitoes were a terrible pest. Distance from the doctor resulted in much suffering, but many plants of forest and field were used for making homely remedies.

The Western farmers were not all of one sort. Some were satisfied to remain half hunters, raising only a few acres of corn and vegetables and depending as much upon gun and trap for food and clothing. Such were apt to be restless and shiftless, who sold their "claims" upon the approach of thrifty neighbors who could afford to buy. Loading their few belongings upon a pack-horse or into a covered wagon, they "struck for the tall timber" and a new claim. Many of these happy-go-lucky pioneer farmers "settled" and moved several times in the course of a lifetime. Meanwhile, they lived a mean and commonplace existence, their children growing up dirty and ignorant, with no opportunity for a better life.

The industrious and thrifty farmer cleared more of his farm each year, and built a better barn and house. He kept a few cattle and sold his products at the nearest town or to the traveling traders. He was glad to see the value of his property increase as more farms were improved about him; then he, too, might sell his farm and go farther west where land was cheap. Or, he might become a capitalist farmer, like the one who stood ready to buy him out. This farmer had surplus money with which he could buy better implements and improved stock. He built good fences and drained his land. His children not only finished the country school but were later sent to college. If he was a large Southern farmer he had slaves, lived to a degree in luxury, and spent some

time each year in Washington or New York, or at some northern summer resort.

There were, then, in the eastern half of the Mississippi Valley, a hundred years ago, several types of farmers; each class pushed the one ahead of it farther toward the West. Everywhere there was plenty to eat and wear — no heavy taxes, no grinding poverty. Every man was “as good as his neighbor”; hence, the West became the home of democracy. Every farmer might, if he would, become independent and thus start his children upon their way toward a higher plane of living and more cultivated surroundings.¹

¹ Good descriptions of pioneer life are found in James, *Readings in American History*, 168-176, 411-419.

CHAPTER XI

THE RISE OF COTTON

VERY little cotton was grown in any of the colonies before the Revolution. It was a common garden shrub in the South, and in some places a small amount of cloth was made from the fiber. When it is considered how important this crop became later, overshadowing everything else in the South, it seems strange that it was of such small consequence in colonial times. There are several reasons for this: first, tobacco, rice, and indigo



COTTON

were more profitable; second, the only kind of cotton known at that time was a "short staple" variety, i. e. the fibers were short and very difficult to separate from the seeds. It was not until 1786 that some seed of the sea-island or long staple cotton, which was native to the islands of the Caribbean sea, was brought from the Bahamas to a Mr. Levett, who owned a plantation on an island off the coast of Georgia. Mr. Levett carelessly threw the seeds upon a dunghill, where they sprouted. Out of curiosity he transplanted the young plants, and raised a small crop. Samples of this cotton were sent to England, where it proved to be especially good. The cultivation of sea-island cotton now spread along the

coast, especially as just at this time the planters were suffering from the loss of their indigo market.

This variety of cotton could not be raised inland, but instead there came into use a third variety having short fibers and green seeds. With this upland cotton, as with the first kind mentioned, the fibers stuck fast to the seeds. This was the greatest obstacle to the profitable production of the crop. The sea-island variety could be cleaned by the use of a hand machine, known as a "churka." This consisted of two parallel rollers placed close together and turned in opposite directions by a crank. As the cotton was run between the rollers, the seeds were pulled loose and left behind. But this machine was of little use for the short staple variety, so the greater part of that cotton was cleaned by hand at the rate of a pound or less a day. Slaves were often required to clean four pounds a week each, working evenings and at odd times.

During the Revolution the prices of English goods were high and the people were anxious to manufacture their own cloth. This gave some encouragement to the raising of cotton. But the expense of cleaning it made cotton goods more costly than the woolen and linen goods in common use.

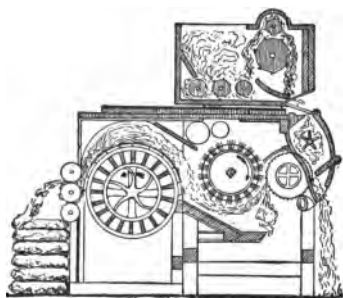
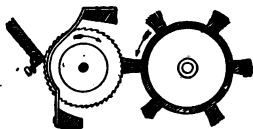
In the year 1792 there was graduated from Yale College in Connecticut a young man named Eli Whitney, through whose efforts a complete change in this situation came about. Whitney had never lived in the South, nor had he ever seen cotton or cotton seed. He went down to Georgia with the intention of teaching school, and on the way became acquainted with Mrs. Greene, the widow of Nathaniel Greene, the great American commander in the South during the Revolution. Whitney's experi-

ences upon this journey, and the events that followed, can best be told by quoting a letter written to his father the following year (1793). "I went from N. York with the family of the late Major General Greene to Georgia. I went immediately with the family to their plantation about twelve miles from Savannah, with an expectation of spending four or five days and then proceed into Carolina to take the school as I have mentioned in former letters. During this time I heard much said of the extreme difficulty of ginning cotton, that is, separating it from its seeds. There were a number of very respectable Gentlemen at Mrs. Greene's, who all agreed that if a machine could be invented which would gin the cotton with expedition, it would be a great thing both to the Country and to the inventor. I involuntarily happened to be thinking on the subject and struck out a plan of a Machine in my mind, which I communicated to Miller (who is agent to the executors of Genl. Greene and resides in the family, a man of respectability and property). He was pleased with the plan and said if I would pursue it and try an experiment to see if it would answer, he would be at the whole expense, I should lose nothing by my time, and if I succeeded we would share the profits. . . . In about ten days I made a little model, for which I was offered, if I would give up all right and title to it, a Hundred Guineas. I concluded to relinquish my school and turn my attention to perfecting the machine. I made one before I came away which required the labor of one man to turn it and with which one man will clean ten times as much cotton as he can in any other way before known, and also cleanse it much better than in the usual mode.

“This machine may be turned by water or with a horse, with the greatest ease, and one man and a horse will do more than fifty men with the old machines. It makes the labor fifty times less without throwing any class of People out of business.

“I returned Northward for the purpose of having a machine made on a large scale and obtaining a Patent for the invention. I went to Philadelphia soon after I arrived, made myself acquainted with the steps necessary to obtain a Patent, took several of the steps and the Secretary of State Mr. Jefferson agreed to send the Patent to me as soon as it could be made out. . . . It is generally said by those who know anything about it, that I shall make a Fortune by it. . . . I wish you, sir, not to show this letter nor to communicate anything of its contents to any body except my Brothers and Sister, enjoining it on them to keep the whole a profound secret. . . . Only two or three of my friends know what I am about, tho’ there are many surmises in town.”¹

Such was the beginning of the cotton “gin” — a short word for “engine.” The idea was simply that of placing



COTTON GIN

The upper figure shows Whitney's invention. The lower figure shows a later form.

¹ *American Historical Review*, III, 99 ff.

teeth in rows upon a cylinder so that they projected through the spaces between strips of metal. The cotton, being placed over this metal grating, was drawn through by the teeth as the cylinder revolved, while the seeds were left behind. Whitney's first idea was to use circular pieces of sheet iron upon whose edges he could make saw teeth. A number of these pieces were set into a cylinder, side by side, with short spaces between. But he had difficulty in obtaining sheet iron for this purpose. One of the daughters of Mrs. Greene had purchased some iron wire with which she intended to make a bird cage. Says Whitney in another letter, "Seeing this wire hanging in the parlor it struck me that I could make teeth with that." Later, it was found a better plan to use iron saw teeth for this purpose.

There was yet another difficulty. After the cotton fibers had been pulled through the grating they stuck to the cylinder and clogged the machine. Mrs. Greene saw Whitney's efforts to solve this difficulty, and picking up a brush used for sweeping the hearth, said, "Why don't you use this?" Whitney then placed another cylinder in his machine carrying a series of small brushes. These revolved in contact with the first cylinder and freed the teeth of lint.

This was in 1793, and the machine was patented the next year. Before the patent was issued, however, so eager were the people for the invention that they broke into Whitney's shop and carried off his machine. The idea spread rapidly and soon other makers were getting patents upon improvements. Within two years Whitney and his partner, Miller, had set up thirty gins in South Carolina and Georgia, operated by either water, horse,

or ox power. It was not their plan to sell the machines, but to receive pay from the farmers for ginning cotton. Whitney was obliged to bring suits against other persons who were making gins, and he spent in this way all that he earned. South Carolina paid the partners \$50,000, and \$12,000 was received from North Carolina. This money also went for legal expenses in defending the patent.

We may better understand the effect of this invention upon cotton production when we remember that a negro, using the earliest form of hand-power gin, could clean fifty pounds a day instead of one. Operated by power, it became capable of cleaning a thousand pounds each day. Here, then, was the means of placing upon the market cotton, ready for manufacture, in much greater quantities than ever before. It is small wonder that the southern farmers at once began its cultivation.

But this machine would not have caused the great increase in cotton production that it did, had there not come at the same time other changes, quite as great, in the methods of cotton manufacture. Beginning about 1765, a number of inventions had been made in England that greatly increased the amount of cotton that could be spun and woven into cloth. These were the spinning and weaving machines, to which men were just learning to apply the power of that other great invention — the steam-engine. The factories that contained this improved machinery created a great demand and made a market for all the cotton that the South could produce. This fact is illustrated by the increase in the export of cotton from the United States, from six million pounds in 1795 to more than sixty million in 1807. With greater

crops of cotton and much cheaper cotton cloth, the world could afford to buy more cotton goods than ever before. Thus it was that cotton cloth became the cheap and common article for ordinary wear and household use that we know it to be.

In the cultivation of cotton, ridges about four feet apart were thrown up by plowing, and in these the seed was planted. When the young plants were five or six inches high, they were thinned out by the use of the hoe until they stood twelve or fourteen inches apart. The rows needed constant hoeing, and the work of plowing, cultivating, and picking lasted from March to December. With their cotton, as with their other crops, the Southern farmers followed the system of using fresh land as soon as the old fields gave out. Under this wasteful system there was no fertilization, for few cattle were kept, and the cotton seeds were thrown away, instead of being used in the production of oil and fertilizer as at present.

In 1795 raw cotton was worth 35 cents a pound; it is not strange that the production increased from 8,000,000 pounds in that year to 35,000,000 in 1800. Five years later the South was producing twice as much as in 1800, and in 1807 the amount was 80,000,000 pounds. Meanwhile, the price had fallen to 21 cents a pound. By 1820 the product had again doubled and was 160,000,000 pounds. Now this could mean but one thing — the spread of cotton culture westward upon fresh lands. The map (page 132) will show where this occurred.

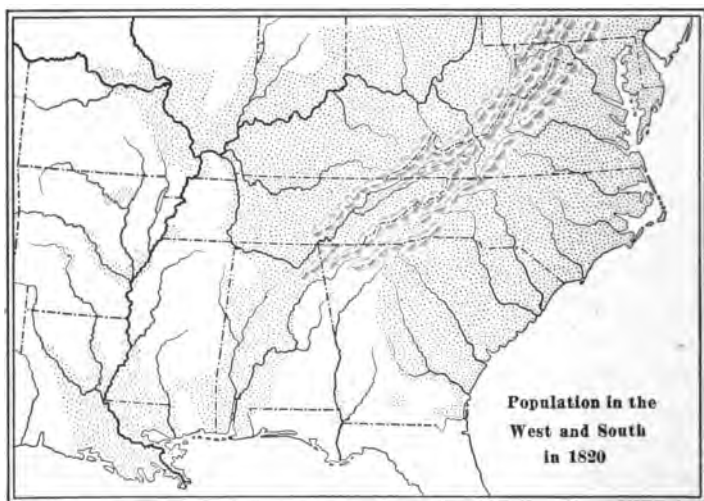
In Chapter VII it was stated that men who came chiefly from the North began to settle in the upland region of the South in the later colonial period. This movement continued after the Revolutionary War.

They were small farmers, raising a variety of crops, and herding cattle on the plains. After the invention of the cotton gin made the raising of cotton profitable, both these upland farmers and the large planters of the coast region devoted much more land to this crop. The latter class, having many slaves, could produce cotton cheaper than could the small farmers, who had only a few slaves or, in most cases, none at all. The result was that, as the fields of the planters became exhausted, they could afford to buy the land of the small farmers, and the latter moved on, taking poorer lands, or moving nearer the mountains, or farther west. Some went into the mountain valleys and became the ancestors of the "mountain whites" of to-day; others settled in Kentucky or moved still farther into Ohio, Indiana, or Illinois.

The large planters did not occupy all of the upland region of the South, for here there remained permanently a large class of small farmers who raised other crops with their cotton. But there was not enough of the rich cotton-producing soil east of the mountains to supply the demand, so there began a great movement westward to the fertile regions of Alabama and Mississippi, where land was bought at prices ranging from fifty cents to three dollars an acre. Here is a description of how the people moved into this region, written by the great naturalist, Audubon, who travelled extensively in the West and South.

"I think I see them harnessing their horses, and attaching them to their wagons, which are already fitted with bedding, provisions, and the younger children; while on their outside are fastened spinning-wheels and looms; a bucket filled with tar and tallow swings betwixt the hind

wheels. Several axes are secured to the bolster, and the feeding-trough of the horses contains pots, kettles, and pans. The servant now becomes a driver, riding the near saddled horse, the wife is mounted on another, the worthy husband shoulders his gun, and his sons, clad in plain, substantial homespun, drive the cattle ahead, and lead the procession, followed by the hounds and



Notice how Southern farmers are settling in the river valleys.

other dogs. Their day's journey is short and not agreeable. The cattle, stubborn or wild, frequently leave the road for the woods, giving the travelers much trouble; the harness of the horses here and there gives way, and immediate repair is needed. A basket which has been accidentally dropped must be gone after, for nothing that they have can be spared. The roads are bad, and now and then all hands are called to push on the wagon,

or prevent it from upsetting. Yet by sunset they have proceeded perhaps twenty miles. Fatigued, all assemble round the fire, which has been lighted; supper is prepared, and a camp being run up, there they pass the night. Days and weeks pass before they gain the end of their journey."

Arrived at their destination, the familiar process of clearing the land began. Each winter new fields were cleared, or the fields of small farmers were bought, and thus the best land was taken up.

Though, as we have seen, cotton had nothing whatever to do with the introduction of slavery in America, there is a very close connection between the growth of the cotton industry and that of the slave system. As the best lands on the tobacco plantations of the tidewater region became exhausted, slave labor became less profitable; then the owners of slaves realized that their labor was not worth what it cost. Considering the first cost of slaves, their wasteful methods of work, and the expense of their support, the planter would in many cases have been better off had he hired his work done by free labor. But here were the difficulties: first, there was great scarcity of free labor in the South; and, second, the negroes were there: would it be safe to free them? Nevertheless, many planters, among them Washington, Jefferson, and Randolph, did free their slaves.

The introduction of cotton in Southern agriculture changed all this. Slaves became more profitable, especially as the cotton plantations were pushed back into the upland region and on farther to the west. It was found that slave labor could be used in raising this crop as in the case of tobacco, rice, and indigo. There were

several reasons for this. The work required in the cotton fields was very simple: plowing, planting, hoeing, and picking do not require great intelligence. In addition, women and children could be employed in some of this work. Few implements were needed, and these might be very crude and simple. The work lasted for nine months of the year. Moreover, the slaves could be readily managed on a cotton plantation: they could work in gangs and hence be easily overseen.

The profitableness of cotton and the opportunity of extending this crop to the West fixed slavery upon the South. Congress forbade the further importation of slaves after 1807; but the temptation to smuggle them from Africa was great, and thousands were brought in.

By the year 1820, Southerners had moved with their slaves across the Mississippi River into Louisiana, and farther north they were migrating up the Missouri River and occupying its fertile lowlands. Hence it was that the question of the admission of Missouri as a slave state came before Congress. According to the decision that was made by the Compromise of that year, Missouri was to be a slave state, but north of its southern boundary ($36^{\circ} 30'$) slaves were not to be held in the Louisiana Purchase.

Very soon after this, American settlers began going into the Mexican territory known as Texas, where they were given grants of land by the Mexican government. In the course of years they became very numerous there, and in 1836 they were strong enough to rebel against Mexico and become independent. Then arose the question of annexing Texas to the United States. Objection was made to this because in Texas slavery was legal,

and since cotton raising was the principal industry there, the people would insist upon keeping their slaves after annexation. The question was decided in the election of 1844, and the next year Texas became a state in the Union. This in turn brought on the Mexican War, because of a boundary dispute. Another reason why the United States government was willing to have war was that a victory over Mexico would mean the annexation of the vast region farther west and extending to the Pacific Ocean. Here, it was thought by some, was a great area where cotton growing would be profitable and where the planters could find plenty of fresh land when their fields were exhausted. In this idea, however, they soon discovered that they were mistaken.

These events are mentioned here to show that behind all this political history are the facts of our agricultural history. It was chiefly the latter that determined the policies of Presidents and Congresses.

CHAPTER XII

THE STORY OF THE PLOW

PROBABLY the most important factor in the improvement of agriculture during our history was the invention of the iron plow. This implement came into general use about 1825, and its story is one of absorbing interest.

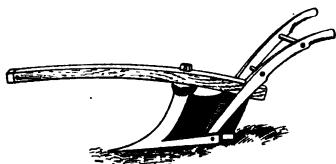
The wooden moldboard of the colonial plow was covered more or less completely with strips or old scraps of sheet iron, a horseshoe, or the discarded blade of a hoe. Often the farmer in making his moldboard selected a section from a tree trunk in which the grain was winding. This he hewed into a curved shape as best he could. The landside was also of wood, but it was shod with iron. The share was of iron, sometimes with a hardened steel point. The colter was of iron, edged with steel. The wooden beam was usually straight, and the handles, rising nearly perpendicular to it, were made from the crooked roots of the white ash.

One will readily see that deep plowing and good control of this plow were impossible. But we must realize that the colonial farmer cultivated much land that was newly cleared. The soil was easily worked and the fields were for the most part small.

About the year 1790, Charles Newbold of New Jersey began to work out the idea of a cast-iron plow. He succeeded in making one, which was patented in 1797.

All the parts, except the beam and handles, were cast in one solid piece. This plow was ridiculed by the farmers of that time. They declared that it was not practical and even persuaded themselves that it was worse than useless, because the iron certainly poisoned the soil!

They said it made the weeds flourish, while good seed would not sprout in the furrows turned by it. Newbold was persistent and spent \$30,000, which was all he



CHARLES NEWBOLD'S PLOW
The first cast-iron plow to be patented in the United States.

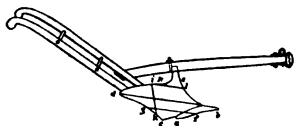
had, to introduce his invention, but without success.

Meanwhile the problem of the proper shape of the moldboard of a plow was being studied in a most careful manner by a Virginia planter — Thomas Jefferson. This man is most often thought of as a patriot and a statesman; he was also a student, a scientist, and a philosopher. Moreover, he took great interest in agriculture. During his travels in France and Italy after the Revolution, he said, "In architecture, painting, and sculpture I found much amusement, but more than all in their agriculture, many objects of which might be adopted by us to great advantage." In France he often watched the peasants plowing and commented, "Oxen plow here with collars and harness. The awkward figure of their mould-boards leads me to consider what should be its form." On his return from Europe, Jefferson found that his estate at Monticello had suffered greatly from mismanagement. He said, "A ten years' abandonment of my lands to the unprincipled ravages of overseers has brought on a degree of degradation far beyond what I

expected." He found that "time, patience, and perseverance" were required in agriculture, as in politics.

Jefferson's chief interest in the plow lay in the problem of so shaping the moldboard that it would do its work most effectively and at the same time offer the least resistance. What shape would turn over and pulverize the soil most thoroughly and at the same time make the plow most easy to draw? To this problem Jefferson applied his mathematical principles in a long essay upon the subject. It was his idea that, if the proper shape could be found, all plows might be made exactly alike and not each one by guesswork. This, he said, was the root of all progress and would begin a new era in agriculture. Jefferson did not seem to realize that different soils demand different shapes and styles of plows. While his efforts did not have any immediate practical effect, his study of the question directed attention to the fact that such improvements in agriculture were both possible and necessary.

The man who first made the iron plow a practical implement was a Quaker named Jethro Wood, whose home was in New York State.



JETHRO WOOD'S PLOW, 1819

Once when he was a boy he melted a pewter cup and molded from the metal a tiny plow. He hitched a cat to this — and got a whipping for his fun. He was constantly whittling the shapes of moldboards out of wood or potatoes, and later he corresponded with Jefferson upon the subject.

Wood's first patent was obtained in 1814. His improved plow was patented in 1819, and had parts that

could be replaced if broken. These were fastened together without screws or bolts, by having interlocking parts that could be wedged together. Wood helped the blacksmith in making his patterns. He sent one of his plows as a present to Alexander I, Czar of Russia. Accompanying it was a letter which Wood had a friend translate into French. The Czar sent Wood a diamond ring. This came first into the hands of Wood's friend, and never reached Wood himself.

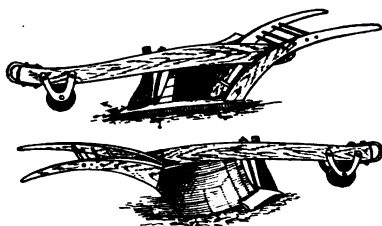
No sooner had the iron plow been put upon the market than many inventors and manufacturers began to copy it and its use became widespread within a few years. Wood brought suits against these people, but died before his rights were secured. His son continued the fight in the courts, and later his four daughters. The loss of Wood's entire fortune was the result. It is said that the entire amount received by his heirs from his invention was \$500.

But the country received the benefit of the iron plow from which Wood and his family got nothing but sorrow and loss. Without it, our agriculture, and indeed our entire history, would be very different.

That the iron plow was not immediately used everywhere is shown by the story of Daniel Webster's plow. Webster, one of our greatest lawyers and statesmen, was also an enthusiastic farmer. He was especially fond of big, sleek oxen, and took great pains in raising them. He carefully matched the oxen in pairs for the plow. His farm was located near Marshfield, Massachusetts, upon a beautiful site overlooking the sea.

Webster was anxious to improve the methods of plowing of his time, the common depth of the furrow being

not more than four or five inches. He had one field from which a growth of scrub oak had been cut; but the stumps and roots were still thick there and too tough



DANIEL WEBSTER'S PLOW

Showing both land side and furrow side.

for any plow to remove.

So, in 1836-7, Webster made a plow for this especial purpose. He carefully selected a tough white oak trunk, from which he made a beam twelve feet long. Then

he had a wheelwright make a wooden moldboard under his direction, occasionally lending a hand himself in the work. He had a blacksmith cover it with straps of iron and make an iron share and colter. This immense plow cut a furrow twelve inches deep. Says a writer: "I have seen the great man holding the plow, assisted by some six or eight farmers, with strong arms, while it was propelled by six pairs of oxen, tearing up roots and everything else that stood in its way." Webster himself testifies: "When I have hold of the handles of my big plow in such a field as this, with four yokes of oxen to pull it through, and hear the roots crack, and see the stumps all go under the furrow, out of sight, to observe the clean, mellowed surface of the plowed land, I feel more enthusiasm over my achievement than over my encounters in public life at Washington."

We have seen that the soil of the newly cleared wooded land was loose and easy to work, but when the Western pioneers settled upon the tough sod of the prairies they found that even the best iron plows were not equal to the task of subduing it. In places the roots of grasses

had grown for centuries undisturbed, matted close for several inches in depth. Elsewhere, the young oaks that sprouted each year were burned off above ground by the prairie fires; but the roots continued to grow for years beneath the sod, spreading far and becoming very hard. Out of this necessity the prairie-breaking plow was invented. It had a moldboard with a long, easy curve that turned the tough sod more readily than did the old-fashioned plow. In some cases iron rods took the place of a part of the long moldboard.

Other difficulties arose besides those with sod and roots. Much of the prairie soil was a sticky loam, difficult for even the most modern implements. In the forest region the soil became more compact and harder to plow as it was cultivated year after year. For such soil it was necessary to find a moldboard that could be polished so smooth that it would scour.

To accomplish this result John Lane, about the year 1833, made the first steel moldboard. His little shop stood on the shore of Lake Michigan, where the city of Chicago was then making its beginning. The moldboard was made by using three pieces of an old cross-cut saw and fastening them to an iron frame. A few years later John Deere made similar moldboards and then sent abroad for steel from which to manufacture them in his factory.

There were two defects in all the early iron and steel plows. The moldboards were rough on account of the "blow-holes" left on the surface when the metal was cast; and they were also brittle. James Oliver, of South Bend, Indiana, worked for many years trying to overcome these defects. He spent all of his money and lost

most of his friends. He saw that when the molten metal was cast into the mold, gases collected on the surface of the newly cast moldboard, thus causing blow-holes. To prevent this he made grooves along the inside surface of the mold and so allowed the gases to escape. To render the moldboard less brittle, Oliver invented a method of annealing that toughened the metal. These improvements resulted, about the year 1869, in the chilled steel moldboard. Another step in the right direction was taken when, about the same time, John Lane, the son of the man previously mentioned, invented the "soft center" steel moldboard. Only the surfaces of this moldboard are steel, the center being soft iron. The iron renders the metal lighter than it would be if made of solid steel, and it is also less brittle.

While these inventions were being worked out, other men were experimenting with sulky and steam plows. Very important, also, in prairie agriculture was the gang plow, first drawn by horses and later by the traction engine.

These improvements in plows would not have been so valuable if the rest of the process of cultivating fields had not also been improved; for men could not work over their plowed fields with hoes and rakes; there had to be better harrows and cultivators. The earliest kind of harrow used was simply the branch of a tree dragged over the field. The teeth of colonial harrows were of wood, but later iron and steel came into use. Then they were given a backward slant, and about 1870 there was invented the lever for changing the pitch of the teeth. At the same time the spring-tooth harrow was patented.

The Englishman, Jethro Tull, who spent his life urging the use of "horse-hoes" and seed-drills, has already been mentioned. He lived in the eighteenth century. These inventions received much time and effort at the hands of other men, but they did not come into common use in this country until the period just before the Civil War. Important as these implements are, their place is clearly second to that of the plow, which is at the basis of all successful farming.

CHAPTER XIII

WHEN REAPERS WERE NEW

A REMARKABLE fact about the history of American agriculture, and that of other countries as well, is the lateness of the improvements in farm machinery. A hundred years ago men were using practically the same implements that had been common among the Greeks and Romans of ancient times. In fact, their farm machinery was not far advanced over that of the ancient Egyptians who tilled the fertile valley of the Nile centuries before the time of Christ. The implements used in this country about the time of the War of 1812, for instance, were the wooden plow with iron point, the wooden-toothed harrow, the hoe and spade, the reaping sickle, and the flail.

Indeed, as late as 1838 a report made to a New England agricultural society stated that "A plough, a harrow, hoe and shovel, with a small sprinkling of forks and rakes, and a few nameless *et ceteras*, comprise the whole range of most of our tool sheds; and these, too, so ill constructed; requiring in most cases twice the power to use them that better contrived implements do; uselessly consuming time, talent, and temper; to say nothing of the wear and tear of conscience that such fretting is apt to induce."

However, one improved implement besides the iron plow was found upon American farms before that time, namely, the grain cradle. This came into use about the

year 1800. Its virtue lay in the fact that by it the grain was laid in better position to be gathered up easily and quickly by the binders than was the case with the scythe.



THE OLD WAY OF REAPING

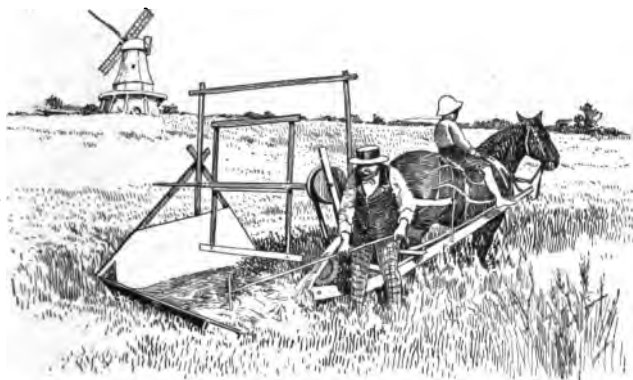
A great many inventors, both in Europe and America, worked upon the making of a machine for cutting grain before the modern reaper was invented. In some of the early machines the cutting apparatus consisted of a set of shears; in others it was a circular disk with a sharp cutting edge. With some, the heads of the grain alone were cut. These machines were in some cases pushed from behind by horses or oxen. One part after another of the reaper that finally became successful was worked out by different men, some in England and others in this country. Therefore, we must say that the perfected machine was not invented by any one man, but by many; it was the result of combining many useful features and devices — the product of many minds.

The cutting apparatus on the successful reaper consists of a series of triangular blades, sharp upon the two exposed edges and fixed side by side, like large saw teeth, upon an iron bar. This bar or knife is given a vibrating

motion as the reaper moves forward, and the blades are thus made to pass back and forth between double fingers or guards. These hold the stalks of grain that are cut by the rapidly moving blades. The idea of this device seems to have been worked out in America at about the same time by two men — Cyrus McCormick and Obed Hussey. Which should have the credit for the invention has long been a matter of dispute. Hussey's patent was dated December 31, 1833, and McCormick's June 21, 1834. But it is claimed that McCormick used his machine in actually cutting grain in the harvests of 1831 and 1832, as well as that of 1833. On the other hand, he admitted that his reaper was not a complete success until certain improvements were patented in 1845. Without attempting to determine the relative part he played in giving us our modern harvester, let us look briefly into the life of this remarkable man.

Cyrus McCormick was descended from a Scotch-Irish family that had settled in Pennsylvania in colonial times. It has been stated that many of these people moved southward, and the McCormick family settled upon a farm in the Shenandoah valley, known as Walnut Grove. Here Cyrus was born in 1809. The father, Robert McCormick, was constantly working upon improvements in farm machinery, and among other things the invention of a reaper took much of his time. But he was unsuccessful in this. However, the machine which was a failure for the father proved useful, as it stood out in the weather by the side of the workshop, in arousing the curiosity of the son. As he grew older, Cyrus showed much more interest in the work of the carpenter and blacksmith shops than in that of the fields;

the result of his work upon the reaper was the invention of a device which was practically that described above as the cutting apparatus still in use. It is said that he used a machine having this device in cutting a field of rye in the summer of 1831.



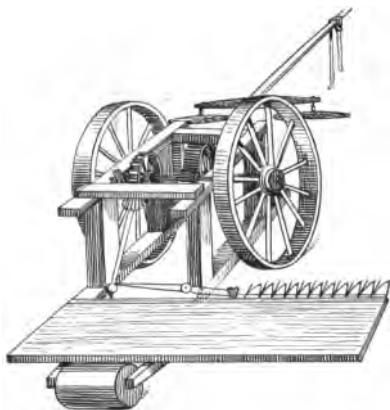
THE FIRST TYPE OF McCORMICK REAPER

Not satisfied with the results of his first efforts, McCormick worked patiently to improve them, testing his machine during the two following harvests before applying for a patent. Some of his neighbors testified in writing, in 1833, that they had witnessed the cutting of wheat by his machine at the rate of about twelve acres a day. This reaper had no raking apparatus, but a man walked by its side, raking the grain off the platform.

During succeeding years until 1845, McCormick, with the aid of hired labor, made his machines in the little workshop on his father's farm. He sold the first reaper in 1840, and in 1845 fifty were sold. At this time the inventor made a trip through some of the Western States. He then discovered that the reaper would be much more

useful upon the broad level prairie farms of the West than upon the small hilly ones of the East. For this reason he proposed to move his factory to a more suitable location than that of the Virginia valley homestead, where neither canal nor railroad could reach it. He went to Brockport, New York, on the Erie Canal, and here for three years manufactured reapers. At the same time he made arrangements with a factory in Cincinnati to manufacture them. But McCormick showed even greater wisdom when, in 1847, he moved to Chicago and there set up his factory in the center of the great grain producing region of the West. By the year 1860 his factory was turning out 4000 machines each year.

Meanwhile, other contestants for the honor and profit of this invention had come forward. Most prominent



HUSSEY'S REAPING MACHINE — 1833

among these was Obed Hussey, whose patent was dated six months earlier than that of McCormick. The cutting apparatus on Hussey's reaper, used in 1833, was much like that used by McCormick. His machine carried a frame and seat upon which a man rode, at the same time raking the grain off onto the

ground. Hussey was a Quaker, and his poverty kept him from developing his machine rapidly. Moreover, he did not show the energy and perseverance displayed by Mc-

Cormick. In making improvements upon their machines, Hussey and McCormick borrowed ideas from each other, and it is possible that both got ideas from English inventors of the same time. When the terms of the patents of both men expired, they applied to Congress for an exten-



MCCORMICK'S REAPING MACHINE

As advertised in *The Working Farmer*, 1852. Notice that a man rides on the machine to rake off the grain.

sion, but both were refused. McCormick fought many suits in the courts to maintain his rights. At one time Abraham Lincoln was employed as his lawyer. McCormick was the most successful of all the inventors whose ideas have gone into the perfection of the modern reaper.

The reader should not fail to note here the vast importance of this invention. All of the small grains require very careful handling at harvest time. When ripe they must be cut within a few days, or else the grain spoils in the field or falls to the ground. The invention of the iron plow, and especially the opening of the level prairie lands of the Northwest, made possible the cultivation of the small grains upon a larger scale than ever before. But what use to plow and cultivate these great

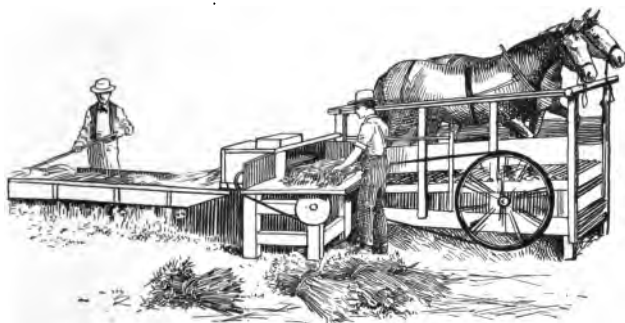
fields, if the sickle and cradle alone were to cut the grain? The best that could be expected from a man using the cradle was about one and one-half acres a day. Suppose, then, that ten days were allowed for the harvest. It would require ten men merely to cut a quarter section of wheat, taking no account of the great labor of binding and shocking the grain. Not enough farm hands could be obtained to do the work by these methods.

Besides, in the years between 1825 and 1860, another industry was growing very rapidly in the United States, namely, manufacturing. While by far the larger number of people lived on farms, the workers in factories were rapidly increasing and must be fed by those who raised the crops of the country. The well-being of all who dwelt in cities, whether engaged in manufactures, commerce, or the professions, was bound up in the success of the iron plow, the cultivator, the drill, and the reaper. For cheap bread depended upon the farmers' ability to cut large fields of grain; and this, in turn, depended upon the use of improved machinery in plowing, seeding, and cultivating.

But there is another step in the handling of small grains before the farmer is ready to deliver his crop to the miller: the process of threshing. The wooden flail and the threshing floor were in general use down to this period of our history. With the flail, from eight to sixteen bushels of grain, depending upon its condition, could be threshed out in a day by one man. On the best threshing floors, when four teams of horses were used and kept going at a slow trot, some three hundred bushels was a day's task. The crude methods of separating the grain from the chaff by tossing or sifting it in a breeze required

a vast amount of patience, and were at best wasteful and unsatisfactory. A fanning mill for this purpose came into use early in the nineteenth century.

Many attempts were made to invent a practical threshing machine; and, as in the case of the reaper, the result, when it came, was the product of many minds. The



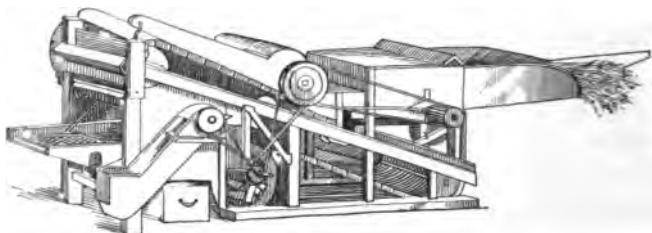
THRESHING MACHINE.—1852

Advertised in *The Working Farmer* as "Emery and Company's New York State Agricultural Society's First Premium Railroad Horse Power and Over-shot Thresher and Separator."

earliest kind had a series of flails attached to a revolving cylinder. Later, wooden pegs were set in the cylinder in such a way as to catch and beat the grain. It was 1850 before the separator was attached to the thresher and the winnowing took place in the same machine, instead of in a fanning mill. Some of the early threshers were stationary, the grain being brought to them from the various farms of the surrounding region. The best threshing machines were made in Scotland, where they were in successful use by the year 1814; but it was not until 1840 that they became common in this country. In the great Paris exposition of 1855, the thresher made

by Hiram A. and John A. Pitts took a prize; their machine included the endless apron and other features of our modern thresher.

The decade or two before the Civil War saw an increased demand for American grain, not only in the growing manu-



THE PITTS THRESHER

From *The Cultivator* for August, 1840.

facturing centers of this country, but also abroad. Manufacturing had become a great industry in England somewhat earlier than in the United States. At the time when agriculture was still their most important industry, the English government had enacted measures, called "corn laws," putting high duties upon grains imported into that country. But as their factories became more numerous and their cities grew, these laws became oppressive to the poor laboring people, who demanded cheaper bread. Finally, in 1846, after much agitation against the selfish interests of the great landlords, the corn laws were repealed.

Now American grain could be sold cheaper in England, and American exports increased. This was just at the time when the opening of the prairie farms and the invention of machinery enabled farmers to produce a greater amount of grain. About the same time (1838), steam-

ships began to cross the Atlantic Ocean, while in this country the building of canals and railroads was going forward rapidly, and the products of the western farms could be brought cheaply to the Atlantic seaports and to the manufacturing cities. Consequently, this was a period of great prosperity for the farmers of the United States, as it was for workers in other industries as well.

This was the period when, owing to the use of improved farm machinery, agriculture changed its character more rapidly than at any previous time since the settling of America. Farm life also began to be different, for the growth of factories took away from the home more and more of the handwork that had found a place there from the earliest times. Gradually the farm was ceasing to be a factory. The railway made it possible for agricultural products to be sent long distances to large markets, and for all kinds of manufactures to be bought cheaply at the country stores. The greater number of newspapers and the invention of the telegraph also aided in making farm life different from that of previous times.

However, these changes came about very gradually, as is shown by this brief description of home life on a farm in western New York, about the year 1850.¹ The farmer in this case was intelligent and progressive, a reader of *The Rural New Yorker* and *The Genessee Farmer*. He had no reaper, probably because they were too expensive. One of his daughters writes as follows: "My recollections of my childhood home are very pleasant. Of the ten brothers and sisters in the home, some of the older ones were always away, attending school or teaching. The holidays and home-comings of the absent ones and

¹ The home described is that of the author's grandparents.

the family gatherings were 'red-letter' days to us children. Thanksgiving time, with its preparations and feasting; Christmas, with the hanging up of stockings and the scramble to see what Santa Claus had put into them; the Fourth of July, with its fire-crackers and the thrills of patriotism, were great days of the year. But other special occasions stand out in my memory: the last day of school, with its public exhibition, the apple-paring bees, the sugaring-off time, threshing days, sheep shearing,



SHEARING SHEEP

butchering, and house-cleaning were always hailed with delight by us children as occasions of unusual stir and excitement. Even the dipping of candles, soap making, and white-washing days brought joy to us. Then the gathering in of the winter stores, the apples into the cellar bins, spitzenburghs, greenings, seek-no-furtheres, northern spies, none-such and russets; the pippins, pound sweets, and jilly flowers for earlier use; the pumpkins gathered in piles by the barnyard fence, with the choicest ones

MAY, fifth month. — Begins on Saturday. 1841.



AUGUST, eighth month. — Begins on Sunday. 1811



DECEMBER, twelfth month. Begins on Wednesday. 1841.



M.D.
W.D.

Aspects, Holydays,
Courts, Weather. &c.

FARMERS' CALENDAR.

PICTURE FROM THE "Maine Farmer's Almanac FOR 1841"
After a copy in the library of the Wisconsin State Historical Society.

put into the cellar; the cider-making and boiling down; the cider apple-sauce made by the half-barrel; the preserving and drying of fruits and of pumpkins; the smoking and drying of hams and beef; the trying out of lard and making of sausages; the making of the winter supply of mincemeat, were among the household industries.

“Then there was the spinning, twisting, and winding of yarn to be knitted in the home or to be sent away to be woven into fabrics for blankets and sheets and wearing apparel. There was the coming to the house of a tailoress to sew by the week, making the men’s heavy clothing, and of a seamstress to make the shirts and to do the family dressmaking. Those busy, stirring times are pleasant memories to me, while they must have meant toil and weariness and unremitting care to mother and the older children. The corn-cutting and gathering meant cornstalk fiddles to us children, and pumpkin time brought jack-o’-lanterns and much fun, while the early springtime brought pussy willows, whistles, and kites to make our hearts glad.

“Our farm products were wheat, barley, oats, corn, hay, potatoes, and other vegetables and fruits, of which apples and peaches were in greatest abundance, though we had pears, plums, cherries, currants, and berries also. Father raised sheep, cattle, hogs, and fowls to supply our own needs and for market. Small grain was sown by hand broadcast over the ground, previously prepared by plowing and harrowing. Corn was planted by hand, being dropped into the furrows and then covered with the hoe. Father often mixed ashes with his corn, and he planted corn and pumpkin seeds together, one to grow up and the other to spread over the ground. Ripe grain

was cut with a cradle and tied into bundles by hand, then gathered into shocks and brought to the barn-yard and stacked, ready for threshing. Grass was cut with a scythe and cured, then gathered into ricks and cocks and later loaded and brought to the barn.

"Our food was simple, but wholesome and abundant. We had 'coarse' food a good deal, as our parents considered that best for us: bread made of graham flour and cornmeal; grits, hominy, corn meal mush, etc. Our white bread was made without yeast and was called 'salt rising bread.' In the winter, buckwheat cakes, occasionally doughnuts and raised sweet cake, pies, and puddings were also often on our table. Up to about 1840 the food of the family was cooked in the fire-place. Meat and vegetables were cooked in iron pots, hung on a crane over the blazing logs. Mother baked Indian (corn) bread in a covered shallow iron kettle placed on the coals in a corner of the fire-place. For baking white bread, the bricks in front of the andirons were heated by drawing the live coals on to them; then the coals would be brushed back and the pans of bread set on the hot bricks and covered with a 'tin oven.' This was a long, deep tin pan inverted, with a handle for lifting it on and off the bread.

"On winter days father would sometimes go to the 'Potter place' and cut and bring home wood for our next year's use. Here also he cut wild cherry trees and had them made into furniture. Often on stormy days he would get out his shoemaker's tools and mend our boots and shoes, cut a supply of shoe strings, mend the harness, etc. Sometimes he and mother would make our shoes, mother making the upper part of cloth while father would

put on the soles. He had a cupboard always well stocked with cobbler's supplies.

"A few times in the course of the year, father with mother or one of the older girls would go to Rochester, thirty miles away, with a load of farm produce, wool, butter, cheese, eggs, chickens, etc. to exchange for household supplies which could be procured more satisfactorily than at our little village stores. Peddlers supplied many of our wants."

Such was the character of rural life three-quarters of a century ago. One who is interested in doing so might readily make a list of the customs and appliances of farm and home that have disappeared; and he might enumerate in comparison the features that have taken their places, and still others that are entirely new.

CHAPTER XIV

PRAIRIE AGRICULTURE

THE Ohio River was at first the great highway for the westward-moving settlers. From this river they journeyed both northward and southward, using the streams



THE UNTAMED PRAIRIE

that enter it, and also the Indian trails, before the building of roads. They also ascended the Mississippi and its tributaries. Everywhere they found that the country lying near to the rivers was covered with splendid forests. To this condition they were accustomed, and they used the methods already described in clearing the land and

beginning the work of farming. Going farther northward, however, into northern Indiana and Illinois, the frontier settlers found stretches of open prairie land between the forest belts that lined the rivers. And finally, in the region bordering the Great Lakes and across the Mississippi in Iowa and Minnesota, there were thousands of square miles of level or rolling prairies, without any continuous forest whatever, though scattered groves were frequent.

One who lived upon the Illinois prairie in the early days describes it as follows: "The charm of a prairie consists in its extension — its green, flowery carpet, its undulating surface, and the skirt of forest whereby it is surrounded . . . which may be compared to the shores of a lake, being intersected with many deep, inward bends, as so many inlets, and at intervals projecting very far, not unlike a promontory, or projecting arm of land. . . . The eye sometimes surveys the green prairie without discovering on the illimitable plain a tree or bush, or any other object, except the wilderness of flowers and grass, while on other occasions the view is enlivened by the groves dispersed like islands over the plain, or by a solitary tree rising above the wilderness. The resemblance to the sea which some of these prairies exhibit is really most striking. . . .

"In the spring, when the young grass has just clothed the soil with a soddy carpet of the most delicate green, but especially when the sun, rising above a distant elevation of the ground, has its rays reflected by myriads of dew drops, a more pleasing view cannot be imagined. You see the fallow deer quietly feeding on the herbage; the bee flies humming through the air; the wolf, with

lowered tail, sneaks away to its distant lair; prairie-fowls, either in entire tribes, like our own domestic fowls, or in couples, cover the surface. . . . the multitude of these birds is surprisingly great. The plain is literally covered with them in every direction. In the winter when a heavy fall of snow had driven them from the ground, I could see myriads of them clustered around the tops of the trees skirt-ing the prairie. They do not migrate, even after the prairie is already settled, but remain in the high grass near the newly-established farms. I often saw them familiarly mingle with the poultry of the settlers. . . .

"The variety of the wild fruit-trees, and of blossoming bushes, is so great, and so immense the abundance of the blossoms they are covered with, that the branches seem to break down under their weight. . . . In summer the prairie is covered with tall grass, which is coarse in appearance, and soon assumes a yellow color, waving in the wind like a ripe crop of grain. . . . In the earliest stages of its growth the grass is interspersed with little flowers, the violet, the strawberry blossom and others of the most delicate structure. When the grass grows higher,



THE PRAIRIES OF ILLINOIS

Adapted from Gerhard, *Illinois As It Is*. Notice that in the main the belts of woods follow the water courses.

these disappear, and taller flowers, displaying more lively colors, take their place; and still later a series of still higher but less delicately formed flowers appears on the surface. While the grass is green, these beautiful plains are adorned with every imaginable variety of color. . . . In the winter the prairie presents a melancholy aspect. Often the fire, which the hunters annually send over the prairies, in order to dislodge the game, will destroy the entire vegetation, giving to the soil a uniform black appearance, like that of a vast plain of charcoal. . . . No sooner does the snow begin to fall than the animals, unless already frightened away by the fire, retire into the forests, when the most dreary, oppressive solitude will reign on the burnt prairies, which often occupy many square miles of territory.”¹

This prairie region was quite unlike those sections to which the settlers had been accustomed. For many years they hesitated to make their farms upon it, and clung to the wooded belts, though no more fertile soil could be found than the black prairie loam, three or more feet deep. There were several reasons why the settlers at first avoided the prairie. Timber was necessary for their buildings and fences. Often, too, there was scarcity of water on the prairies. Moreover, the woods gave protection from the storms of winter and the heat and troublesome prairie flies of summer. Another obstacle was the tough prairie sod, which made plowing very difficult. Some of the early settlers believed that the prairie was not fertile and that this was an unwholesome region in which to live. It is true that much of

¹ Gerhard, *Illinois As It Is*, 272 ff.

the level prairie was low, and where swamps were common the people suffered from fever and miasma.

But when the forested regions were well taken up, settlement spread to the smaller openings, where the farmers built their houses upon the edge of the woods. Thus the larger prairies were gradually attacked. This



GOING WEST BY ERIE CANAL

process was greatly aided by the invention of the prairie breaking plow, which has been described in Chapter **XII**. It was pulled by three, four, or five yoke of oxen, and cut a strip of turf twenty or more inches wide and two or three inches deep, which was turned completely over.

Certain events that must now be mentioned also had an influence, similar to that of the breaking plow, in hastening the settlement of the prairies. In 1833 the Cumberland, or National, road was completed as far as Columbus, Ohio, and thousands of emigrant wagons moved upon it every summer, headed westward. In 1816 steamboats were used on Lake Ontario and in 1818 on Lake Erie; and soon they were carrying their loads of land-seekers to the West. In 1825 the Erie Canal

was completed, and this became the highway of travel for New Englanders, New Yorkers, and newly arrived immigrants from abroad.

After the War of 1812 there had been a period of hard times; this led many to seek their fortunes in the West. So rapid was settlement, so many farms were opened

and new towns built, that much Western land was bought by speculators. Land advanced very rapidly in price and often sold for more than it was really worth. Then came the terrible crisis of 1837, when those who had invested in Western lands at high prices found their fortunes gone. Business was stopped in the East, and numbers of bankrupt business men and laborers out of work



MAP SHOWING POPULATION, 1830-1840

In this decade the population had spread rapidly over the prairies of the Middle West, and had also increased the extent of the cotton-growing area.

sought the West as the place for beginning life over again. It was under these circumstances that the prairie region east of the Mississippi River was settled (see the map).

It is interesting to note how conditions of farm work and farm life here differed from those that existed in the forested region farther east and south. In the first place, little clearing, except the cutting of hazel brush, was necessary, so the farms could be brought under

cultivation much more rapidly than in the forested regions. After the sod was broken, a crop of "sod corn" might be raised the first year merely by dropping the seed into the break between the furrows or into a slit made by an ax. At the end of the season, the sod, if it had not been plowed too deep, had rotted and the field might be cross-plowed. Then a crop of wheat was sown; or, this might be done while the cornstalks were left standing, since they would keep the protecting snow from being blown off by the sweeping winter winds. The fresh prairie soil yielded crops of from fifty to one hundred bushels of corn, twenty-five of wheat, and forty or more of oats and barley.

The life and work of a boy on one of the pioneer farms in southern Wisconsin is described by John Muir, the celebrated naturalist, whose family moved there from Scotland. He says: "At first, wheat, corn, and potatoes were the principal crops we raised; wheat especially. But in four or five years the soil was so exhausted that only five or six bushels an acre, even in the better fields, were obtained, although when first plowed twenty and twenty-five were about the ordinary yield. More attention was then paid to corn, but without fertilizers the corn crop also became very meagre. At last it was discovered that English clover would grow on even the exhausted fields, and that when plowed under and planted with corn, or even wheat, wonderful crops were raised. This caused a complete change in farming methods. The farmers raised fertilizing clover, planted corn, and fed the crop to cattle and hogs.

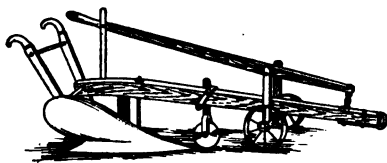
"In summer the chores were grinding scythes, feeding the animals, chopping stove-wood, and carrying water

up the hill from the spring on the edge of the meadow, and so forth. Then breakfast, and to the harvest or hayfield. I was foolishly ambitious to be first in the mowing and cradling, and, by the time I was sixteen, led all the hired men. An hour was allowed at noon, and then more chores. We stayed in the field until dark; then supper, and still more chores, family worship, and to bed; making altogether a hard, sweaty day of about sixteen or seventeen hours. . . . In winter, father came to the foot of the stairs and called us at six o'clock to feed the horses and cattle, grind axes, bring in wood, and do any other chores required; then breakfast, and out to work in the mealy, frosty snow by daybreak, chopping, fencing, and so forth. So in general our winter work was about as restless and trying as that of the long-day summer. No matter what the weather, there was always something to do. During heavy rain- or snow-storms we worked in the barn, shelling corn, fanning wheat, thrashing with the flail, making axe-handles, ox yokes, mending things, or sorting sprouting potatoes in the cellar. . . .

"As for money, for many years there was precious little of it in the country for anybody. Eggs sold at six cents a dozen in trade, and five-cent calico was exchanged at twenty-five cents a yard. Wheat brought fifty cents a bushel in trade. To get cash . . . it had to be hauled to Milwaukee, a hundred miles away."

"Our breaking plow turned a furrow two feet wide, and on our best land held so firm a grip that, at the end of the field, my brother, who was driving the oxen, had to come to my assistance in throwing it over on its side to be drawn around the end of the landing; and it was

all I could do to set it up again. But I learned to keep that plough in such trim that after I got started on a new furrow I used to ride on the cross-bar between the handles, with my feet resting comfortably on the beam, without having to steady or steer it in any way until it reached



BREAKING OR SOD PLOW
Historical Department of Iowa.

the other end, unless we had to go around a stump, for it sawed through the biggest grubs without flinching.”¹

The prairie farmer, unless he lived in an “oak opening,” was puzzled at first how to provide himself with fences. There were few logs, so the “snake” rail fences common elsewhere were seldom seen. Lumber was scarce and expensive. Sometimes sod was used and upon it hedges were planted. Young trees, set thickly, made a good fence. Later, the invention of barbed wire solved the difficulty and had important results.

Upon what terms, it may be asked, did the early prairie farmers obtain their lands? It will be remembered that by a law of 1820 the price of government land was reduced to \$1.25 an acre. By a law of 1832, the land might be divided into forty-acre tracts. Land offices were established at various points in the West. When a tract had been surveyed, it was opened for settlement. On certain days, advertised beforehand, the land was offered to the highest bidder at auction, but the price must be at least \$1.25 an acre. Later, any that was unsold could be bought for that price at private

¹ John Muir, *The Story of My Boyhood and Youth*.

sale. As the day for opening the land office, or for beginning the sale of a particular tract, approached, scores of prospective buyers would gather, anxiously awaiting the opportunity to get choice "quarters" (i.e. quarter sections, of 160 acres). From the active buying that followed such occasions has come the common expression, "land office business."

There were laws that prohibited settlers from moving onto Indian lands and those that had not been surveyed, but these laws were many times broken by the eager land-seekers. Often they could not afford to wait in the city where the land office was located for the sales to begin. Then, too, it was often expensive to make a journey to the land office at a particular time. Thus it happened that upon Indian and government lands, both surveyed and unsurveyed, there were thousands of "squatters" who had no legal title to their farms. Sometimes they had to be driven off the Indian lands by government troops. Of course, any person who bought at a land office a tract that was already under cultivation by a squatter had the legal right to force him away, unless the squatter would buy the farm. In this period speculators bought large tracts of land with no intention of farming them. It seemed, therefore, that the entire system worked a hardship upon the poor squatter; but, on the other hand, he was responsible for the careless and unlawful manner in which he had begun his farm. In order to protect themselves from "claim-jumpers," as the purchasers of occupied land were called, the squatters often formed associations, agreeing that they would protect their common rights and not allow outsiders to buy their claims. At the auction sales they agreed not

to allow anyone to bid higher than \$1.25 an acre. If an outsider did this, or attempted to buy land that was already occupied, he was threatened with a club or a halter until he was glad to get away from the neighborhood.

In this way there grew up the custom of recognizing the right of a squatter to the land he occupied; and Congress made provision for this situation by passing "pre-emption laws" at different times. Finally, in 1841, it was enacted that the squatter should have the first right to purchase his farm at the regular government price.



BUFFALOES ON THE PLAIN

× In the Far West the settler's house was often built of sod. Cattle were not well cared for, but were allowed to roam freely on the ranges of government land. When no fences were needed, the raising of cattle was a profitable business. They were fattened with corn, thrown in the ear upon the ground. The pigs were then turned in to clean up the grains left by the cattle.

As in the forest region, wild game was plentiful on

the prairies, and the early farmer obtained much of his food from it. Great herds of buffaloes and deer were frequently seen. There were flocks of partridges and pheasants. Danger sometimes came from the packs of hungry wolves that followed the traveller on his journey. The blinding snowstorms of winter also brought death to many who tried to find their way through them even for short distances.

- \ But the greatest source of danger in the prairie region was the terrible prairie fire. The vast stretches of open country, covered in late summer and autumn with dry grass, were frequently swept by these fires, driven by fierce winds. As a precaution it was necessary for the farmer to surround his house, barn, and fields of growing crops with belts of plowed land over which the flames could not travel. Often the farmer burned the dry grass about his home and fields, with the same object in view. This was called "back firing." Even then, the flying brands and sparks often brought the fire to the farmer's home, and he lost in an hour all the product of years of labor.¹

Like the pioneers of the States farther east, the first settlers of the prairies were sometimes of the shiftless, unsettled sort. They built only poor log or frame houses, in which they suffered great hardship during the severe northern winters. Becoming dissatisfied, or crowded too closely by neighbors, such a farmer would decide to move on when a good chance came to sell out to a more prosperous land-seeker. "The bargain being concluded, he stows his 'plunder' underneath the cover of the large

¹ James Fenimore Cooper's *The Prairie* pictures the conditions here described.

wagon, harnesses his four horses before it, hangs his bucket beneath and his feed-box behind, starts his two cows on in advance, sets his eldest boy on the right-hand wheel horse, with a single rein in his hand, and commences his journey westward, shaking the dust of the Yankee settlements from his feet." The "mover" often had no place of settlement in view, but merely drove on and on for weeks, shooting all the game his family could eat and buying a little bread or depending upon the hospitality of the more thrifty farmers.

But this was by no means the representative type of settler on the prairie frontier. Because better roads had been opened, and especially because the steamboat could bring men from the East so easily and cheaply to the Western lake ports, the better class of farmers came early. They brought implements and stock. They had ready money to spend in making farm improvements. Moreover, men of other occupations, learning that the frontier was not a place of hardship, came in large numbers. Thus the prairie farms and towns were not long kept in the crude pioneer condition seen farther south. Settlement and advancement were both much more rapid.

^ In 1853 the railroad reached Chicago and in 1854 the Mississippi River. Then the newcomers swarmed over the prairie lands of the North Central states and penetrated north into the region of pine forests. In 1850 the Illinois Central Railroad received a large grant of land. When this and the grants made afterward to other railroad companies were put upon the market at low prices, the settlement of the West was still further hastened.

^ Conditions on the prairies of the Central West offered less variety of life and occupation for the younger mem-

bers of the farm household than were found in the wooded region farther east.¹ With the growth of manufactures and the spread of railroads, many articles and implements of common use that formerly were made by hand could now be purchased. The boy on the farm had no less labor to perform, but there were fewer kinds of tasks and those he had lasted longer, and he suffered from the dreadful monotony of them. The fall plowing of the smooth prairie loam lasted for weeks at a time. Corn planting and picking in the large prairie fields, before the days of machinery, soon lost the charm of novelty and became dull, heavy drudgery. Pitching and stacking hay was hand labor that strained to excess the muscles of the growing boy. The task of caring for the cattle offered more attraction. In the early days these wandered at will on the vacant land and it was necessary to go on horseback to hunt them and round them up. This occupation might turn into a merry chase of a rebellious steer; and sometimes wild ponies also gave occasion for a race. Of pleasures on the prairie farm there were many: snaring gophers, chasing wolves, swimming, fishing, and skating. Winter was hailed by the young as bringing relief from the drudgery of heavy work; going to school in those days was equal to having a vacation.

¹ See vivid descriptions in Hamlin Garland's *Boy Life on the Prairie*. Other items in this sketch are derived from this interesting book.

CHAPTER XV

AGRICULTURE IN THE NEW POSSESSIONS

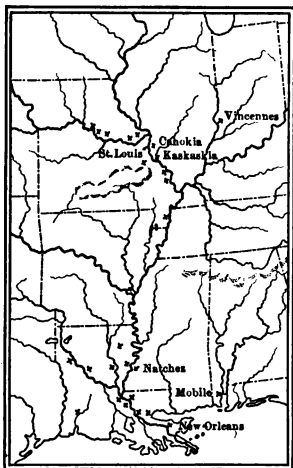
LOUISIANA PURCHASE — TEXAS — CALIFORNIA —
OREGON

×THE history of the United States is the history of a westward-moving people. Closely following the hunters, trappers, and traders, who were ever plunging into the wilderness, came the frontier farmers. These settled along our western borders and even crossed over into regions owned or claimed by other nations.× It is the purpose of this chapter to give pictures of pioneer farming in these various regions, and to show how the acquisitions of territory by the United States were closely related to these peaceful agricultural invasions.

It is well known that in colonial times the French built posts at many points in the Mississippi Valley. In the minds of the French, the principal reasons for establishing these posts were to build up the fur trade and to hold their vast possessions. But here, as elsewhere, agriculture was a necessary occupation, and it was from the fields and gardens of the peasant settlers, or *habitants*, that the soldiers, hunters, traders, and missionaries obtained many of their supplies.

The French farmers of the "Illinois Country" or "Upper Louisiana," as it was called, including the settlements of the present states of Illinois and Missouri, did not scatter and live on isolated farms as the American pioneers of

the West did; instead, they grouped their houses in villages. This was the custom of the mother country, and it secured protection from the Indians. The village



FRENCH SETTLEMENTS IN THE
MISSISSIPPI VALLEY

was a long, straight street (or perhaps two streets) with the houses ranged on either side. The logs that formed the sides of the houses stood on end. Porches, covered by extensions of the roof, were built at both front and back. Each dooryard was guarded by a picket fence, and the gardens at the rear were inclosed in the same manner. Besides his village lot, each *habitant* owned a long, narrow strip of land in the "common field." This field was surrounded by a fence, for protection against both domestic and wild animals, and each *habitant* was obliged to keep up that part of the fence which bordered his strip. Some of the farm implements were owned in common; all were very simple and crude. Besides owning his village lot and common field strip, the French settler had the right to pasture in the meadows and to gather wood in the forest. This system resembled in more than one way the original land and farm system of the New England town. (See Chapter. VI.)

As in New England, a gathering of the men, which here was held by the church door after mass, decided such questions as the proper time for plowing, sowing,

and harvesting. The officer who supervised this work was the *syndic*.

One must not imagine a very advanced state of agriculture in these little forest settlements; for the few products desired were easily raised and the *habitant* loved to hunt and trade with the Indians. It was a simple life with many pleasures, — quiet neighborhood visits with cards and music, and many gay holidays with sports and dances brought from the mother land. But there were also hardships and dangers.

It will be remembered that during the American Revolution George Rogers Clark captured the posts of the Illinois Country for the United States. This caused some of the French to move over into Missouri, where settlements had already been begun. The country west of the Mississippi had been given to Spain in 1763, and the Spanish government was very liberal in granting land to new settlers. To this region there came, besides the French, many Americans from Kentucky and Tennessee. When we gained the Louisiana Purchase, in 1803, some 10,000 settlers lived there. Unlike the French, the Americans generally lived in scattered homes and made typical frontier farms, such as have already been described. Their log houses were often built in two square sections that stood ten or twenty feet apart and were connected by a continuation of their roofs. In the covered space between the sections much of the family life centered, especially during hot weather.

The American settlers were the restless, and sometimes the shiftless, kind who disliked to live in settled communities; they were almost as much interested in hunting and fishing as in farming. The soil in the river bottoms was

very rich, and their hogs and cattle increased rapidly in the woods; so getting a living required little exertion. Still, their farms yielded a surplus, for we find them shipping down the river to New Orleans quantities of flour, bacon, hams, salted beef, and venison, besides tallow and hides.

It was to this region that Daniel Boone came when he found himself surrounded by too many neighbors in his home farther east. He settled on a branch of the Missouri River, after having obtained a large grant from the Spanish government on condition that he should bring 150 families to the Missouri Country. But he never actually got possession of his grant. He lived here until his death in 1820.

Meanwhile, a flourishing settlement had grown up on the lower Mississippi River, in the vicinity of New Orleans. Besides the small farms of the French peasants, we find here plantations worked by slaves and producing sugar, rice, cotton, tobacco, and indigo. The plantations were ranged along the banks of the great river, upon the rich soil that had been deposited by it in its periods of overflow. Dykes or embankments were built on the river's edge to prevent the overflowing of its banks.

Many of the settlers in this region were the Acadians who had been taken from their homes in Nova Scotia when the British conquered that colony.¹ Besides people of mixed French or Spanish and Indian blood, there were also Americans here. The settlements extended up the valleys of the rivers, especially that of the Red, and when Louisiana became a possession of the United States there were about forty thousand people in this region.

It was the conviction that our Western settlements must

¹ Read Longfellow's *Evangeline*.

expand and must have a free outlet for their products that led Jefferson and other statesmen to see the necessity for acquiring New Orleans. In the end, it came about that the United States purchased all of the Louisiana Country.

TEXAS

Just as venturesome American farmers had crossed the Mississippi and settled beyond the borders of their country before the Louisiana Purchase was acquired, so, again, they invaded the Spanish territory of Texas and began to make homes there. Before their arrival, Spanish missions had been established among the Indians during the eighteenth century. But the missions were not on the whole very successful, and many of them were decayed at the time the Americans began to come. Attached to each mission was a small farm; and many cattle ranged upon the plains about it.

Moses Austin, a native of Connecticut, was the first American to plan a movement of farmers to Texas. After losing a fortune in Missouri, he went on horseback to San Antonio and obtained from the Spanish governor a large grant of land (1819). It was his intention to conduct to his grant some three hundred settlers from the United States. Austin died the next year, and the work was carried on by his son Stephen. The grant was located between the Colorado and the Brazos rivers. According to the original plan, each head of a family was to have 640 acres and, in addition, 320 acres for his wife, 160 acres for each child, and 80 acres for every slave that he owned. Austin was to receive twelve and one-half cents per acre to cover the expenses of carrying out the project. The first companies of settlers had many

difficulties, including Indian troubles and failure to get their supplies; and some of them returned.

Meanwhile, great events were occurring. In 1821, Mexico, of which country Texas was a part, became free from Spain. There followed a revolt in Mexico itself, as a result of which it became a republic. Following the example of Austin, many other Americans, known as *empresarios*, or contractors, obtained from the Mexican government grants similar to his. Some of these were vast in extent, until finally the whole of Texas was covered with them. But these *empresarios*, in spite of their big schemes, brought in few settlers. Many more came as individuals. They were the typical western frontiersmen, always on the lookout for more pleasant fields. Since the greater part came from the Southern states, many slaves were thus brought to Texas.

Before the year 1830 there were in Texas about 20,000 whites, most of whom were Americans. The Mexican government had become alarmed at this peaceful agricultural invasion and tried to stop it. The government also abolished slavery, but with no effect in Texas.

A situation such as this could have but one result. Many thousand American farmers and ranchmen, imbued with the free spirit of the frontier, would not permanently be governed under the distant Spanish-American rule of Mexico. The attempt of Mexico to deprive them of their slaves was very irritating. The rebellion of 1836, led by General Sam Houston, gave Texas its independence, and started it on its way toward annexation to the United States. But this was not destined to come about for nine years.

Meanwhile, the population, almost entirely agricul-

tural, grew to nearly 100,000. In the river bottoms, where the soil was of great fertility, the typical crops of the South were grown, including cotton and sugar. Out upon the prairies there was mixed farming. The damp lowlands had growths of canebrake and the prairies had tall grasses of many varieties that made Texas an ideal cattle country. × The new State of Texas (1845) made slavery legal and gave very liberal grants of land to settlers; consequently, at the time of the Civil War Texas was one of the largest cotton-producing states in the South, though only a small fraction of her immense area was under cultivation. ×

CALIFORNIA

Catholic missionaries came into southern California in the latter part of the eighteenth and the first part of the nineteenth centuries. They founded numerous missions, and it was about these that the earliest farm life of California was developed. The mission church had massive stone walls in which were niches and open arches where bells were hung. There were picturesque galleries with arches supported by rows of columns, the ruins of



SPANISH MISSIONS IN CALIFORNIA

which may still be seen. About the mission church was the village, or *rancheria*. Here were clustered the mud brick, or adobe huts of the Indians, the storehouses and the workshops where the Indians were taught the various arts — blacksmithing, carpentry, weaving, and leather work. The mission had grain fields and fruitful orchards, where grew oranges, peaches, and the best of grapes. There were also gardens and pastures. When natural



PLAN OF A SPANISH MISSION SETTLEMENT

water was not abundant, irrigation kept the crops fresh. The work about the mission was done by the Indians, under compulsion, so they were little better than slaves. It was thought necessary to rule the natives with an iron hand, in order that they should lead orderly, industrious lives.

Besides the simple farm life of field and orchard, the missions were the center of another activity — ranching. Thousands of acres of grazing lands were granted to each mission, and here roamed vast herds and flocks. Besides grasses, they fed upon the alfileria, or “filaree,” and wild oats. They were in charge of horsemen, called *vaqueros*, who were of Spanish or mixed Spanish and Mexican origin. They were like our modern cow-boys, dressing in

fancy Mexican style, riding hardy mustangs, and performing wonders with the lariat in catching and throwing the wild steers and horses. One of the missions that owned 76,000 head of cattle, 79,000 sheep, 310 yoke of oxen, and 6000 horses may be thought of as a type of the twenty or more similar establishments that were scattered through southern California. Quantities of hides and tallow were shipped out by vessel to the eastern part of the United States and to Europe. As there was no use for the meat of so many slaughtered animals, the greater part of it was thrown away. The wool of the mission sheep was coarse, and was made into blankets and garments for the Indians.

The destruction of this interesting mission life came when the Mexican government, about 1833, began to seize the property of the Catholic orders and to free the Indians from the control of the *padres* (fathers). The Indians were given land which they were to own as farmers; but they soon fell back into idle and barbarous habits. Again, Americans who came to California in the succeeding years, eager for the best lands, duped the poor Indians and in various ways crowded them off their possessions.

The first Americans in California were hunters, trappers, and traders. But as early as 1835 a Dr. John Marsh had a ranch and farm near the junction of the San Joaquin and Sacramento rivers.

Of more interest is the great estate of John Sutter, a Swiss who had come to California to make his fortune. This was located at the present site of Sacramento. He had extensive wheat fields, flocks, herds, and orchards; there were also workshops where both whites and Indians

carried on all kinds of necessary handwork. Some fifty miles above, on the American River, Sutter built a saw-mill, and it was here, in the mill-race, that Marshall, who was in charge of the work, found the flakes of gold that soon set the entire country afire with excitement.

This was in 1848, and meantime numerous Americans had come overland to California, where they settled as



A CALIFORNIAN WAGON TRAIN
After an old print.

farmers and ranchers. When war broke out between the United States and Mexico, these Americans revolted, and, with the aid of United States troops, took possession of the government. The end of the war brought with it the annexation of California, as a part of the Mexican cession. Following the discovery of gold and the rush of men to the new mines, food of all kinds was very much in demand. Cattle and horses were increased in value a hundredfold. Some who were not crazed by the struggle for gold began to raise potatoes, melons, and vegetables, for which they received fabulous prices; as but little wheat was raised, the greater amount of the flour had to be imported.

It was some years before the settlers of California understood fully the possibilities of the State as a grain-producing region. Meanwhile, better stock was brought

from the East and the cattle business became very important. Where the level lands were treeless the Easterners thought the soil must be poor. Then, too, the barren and desert-like appearance of the plains, which often were parched and cracked by heat and drought, discouraged those who were accustomed to a different kind of country. But when, gradually, the nature of the soil and climate came to be understood, agriculture advanced rapidly, and by 1870 the value of the wheat produced in California almost equaled that of the gold found in its mines.

At first, careless methods of cultivation were used, for the fields were of immense size. Wheat was planted in the fall; after harvest the field was dragged, and this served to scatter the kernels that had dropped from the dried heads. From this seed another, or "volunteer," crop came up; and even a third crop might be realized in the same manner. The wheat was cut by a header, which merely clipped off the heads and threw them into a huge wagon-box that was drawn by the side of the machine. Besides wheat, fruits of various kinds — peaches, plums, nectarines, berries, oranges, olives, and grapes — were produced in great quantities.

For a quarter of a century California continued to be one of the important wheat-producing sections, yearly exporting great quantities of this grain. Gradually, however, the time came about when fruits and mixed farming became more important. This was due partly to the practice of irrigation, partly to improvements in fruit culture and marketing, and partly to reasons discussed in a later chapter (Chapter XIX).

OREGON

North of California lies a vast region, stretching from the Pacific to the eastern range of the Rocky-Mountains and northward to Alaska. This was the "Oregon Country." England and the United States could not agree upon the matter of its possession, but in 1818 they had decided upon a policy of "joint occupation." To whom should this wonderful region belong? This was the question that was decided in the period whose events we are now to trace; and it will be seen that the history of agriculture on the Pacific Coast is closely related to the final decision.

English traders, under the Hudson's Bay Company, established Fort Vancouver, on the Columbia River, in 1825, and made it the center of their business. Here from all directions the hunters and trappers employed by the Company brought their packs of skins and furs; and here, also, was begun the first work in agriculture in the Oregon Country.

Dr. John McLoughlin, who managed the Hudson's Bay Company's business in this district, had at Fort Vancouver a farm that grew to include several thousand acres. It lay in the fertile lands along the Columbia River, and produced various grains, fruits, and vegetables. There were extensive pastures, cattle and horses having been brought from California, and hogs from the Hawaiian Islands. The products of this farm, besides supplying the post, were sold to vessels engaged in whaling along the coast, and to Russians who had posts in Alaska. Later, men who had left the employ of the Company settled down upon little farms and added somewhat to the agricultural life of the vicinity.

Meanwhile, interest in the Oregon Country was being aroused in the United States. Missionaries came there in the thirties and founded mission stations in the Willamette Valley, about sixty miles from the mouth of the river. The most noted of the missionaries was Marcus Whitman. The story of his various journeys to Oregon and his work in gathering followers to go there, until he was killed by the Indians in 1847, is full of interest. Other missions were later founded on the Columbia River



above the present site of Walla Walla. About each mission there soon appeared gardens and cultivated fields; for farmers had come with the missionaries, and a few cattle were secured from Fort Vancouver. In 1837 the settlers formed the Willamette Cattle Company and raised money with which to send men to California for the purpose of securing more horses and cattle. Several hundred were brought back. Besides trying to make converts of the Indians, the missionaries also taught them to raise crops.

And now more settlers began to come to Oregon, attracted by the prospect of obtaining rich land without cost in a country of delightful climate. Missionaries and others returning to the East held meetings, delivered lectures, distributed pamphlets, and so advertised the country. The years that followed the crisis of 1837 were "hard times" in the East, and this fact stimulated migration to Oregon. In addition to its attractions as an agricultural region, the Oregon Country was known to

be rich in other resources — furs, fish, and lumber. So the "Oregon fever" was caught by many, who were induced to try the difficult journey across the desert and over the mountains by the Oregon Trail.

The year 1843 saw a great migration to Oregon. Nearly a thousand people in a company, with more than a hundred covered wagons and several thousand head of cattle, started from Independence on the Missouri River. The company was divided into sections, each with its captains and guides, as well as its body of hunters, who were to secure game for food and to watch for Indian foes. The wagons advanced in single file, at a slow pace, the entire journey lasting for several months. At night the wagons of each division were brought into a circle, the animals were turned out to graze, and the men were divided into groups to stand guard. "After the evening meal there was a social time within the circle, and all were merry. The children frolicked, the young people enjoyed the violin and flute and dance and song, while the older recounted incidents of the twenty miles' travel, and forecast the morrow and anticipated Oregon."

Many smaller companies, both before and after this, undertook the same journey. Some suffered from adverse weather, others from Indian attacks, and still others were lost in the wilderness. All were imbued with the strong American love of adventure and the longing for free land that had carried men and women over the Alleghany Mountains and along the streams of the Mississippi Valley.

In their Oregon homes the settlers lived as did the other frontier settlers whose homes and farms have been described. They raised a variety of products (corn, wheat,

oats, potatoes, and vegetables) and had good markets, not only among the fur traders and upon the vessels that visited the coast, but also in distant California and Hawaii. As they had no settled government at first, they were obliged, like the early settlers of New England and those of the Alleghany Mountain valleys, to form one for themselves.

In addition to the Columbia River settlements, the Americans also went to the Puget Sound region. By the year 1846 there were six thousand Americans in the Oregon Country, and now the question of ownership had to be decided. Great Britain had made a strong claim for the country as far south as the Columbia River, her claim being based chiefly upon the work of her fur traders. But trading stations are a weak indication of actual ownership, as compared with farms. Many Americans raised the cry "fifty-four forty or fight," meaning that our northern boundary should be located at 54° 40' north latitude. Fortunately, the dispute was settled without war. Both sides gave up their extreme claims, and the line was run along the parallel 49° north latitude as the boundary between the United States and Canada.

After the discovery of gold in California, many of the Oregon settlers went there. But those who remained found California a better market than before. They were given by Congress most liberal grants of land—to every citizen then in Oregon 320 acres, and to his wife as much more.

Such were the beginnings of agriculture in these various additions to the original area of our country. In each case American farmers settled in the new region before

it became a part of the United States. And in each case there is a close connection between the fact of agricultural settlement and the fact of acquisition. In other words, we may say that *the flag has followed the farmer*. The adventurous character of the frontier farmer led him by difficult journeys into strange lands in search of a free life and better fortune. And this spirit of the expanding West accorded so well with the ideas of the American people as a whole, that these various acquisitions seemed not only natural but inevitable. In fact, nothing but the Ocean could stay the advancing tide of the men who held the plow.

CHAPTER XVI

THE COTTON KINGDOM

ONE who wishes to get a correct idea of farm life and work in the South before the Civil War should be reminded of several very important facts. (1) Much of the land in the South was uncultivated; the traveller might ride for miles through forests and wild land. Population was very sparse in most places. Besides, the fields exhausted by cotton cultivation were left



SOUTHERN PLANTER'S HOUSE
After a sketch.

to become overgrown with weeds and brush. (2) We have previously seen that not all, nor even most, of the cultivated land was found in the large cotton plantations. These were mainly in the localities of the richest soil. Elsewhere there were small farms. Sometimes the small farmers had one or two slaves, but more often none at all. (3) It must be remembered that while in some respects the great plantations were much alike, there

were yet many differences, just as to-day one may find in any large section of our country great differences in the methods used by farmers. Some may be careful in tilling their soil, intelligent in the use of implements, and kind in their treatment of their animals, hired hands, and children. Others, again, may show exactly the opposite qualities and may be lazy, shiftless, and brutal



NEGRO QUARTERS
From an old print.

at the same time. These differences make it difficult to give in a short space a good description of Southern agriculture. Only some of the more general features can be described.

Of course, the place of most interest in all the Southern country is the large plantation. This might embrace hundreds or thousands of acres, only part of which were in cultivated fields, worked by fifty, a hundred, or even more slaves. The planter's house was a large, square, frame building, painted white, with green shutters, with a fine portico in front. It was located from a quarter to a full mile back from the main road, and was surrounded by trees and perhaps beautiful gardens. Near by were the slave quarters—two rows of cabins facing each other—where one might see numbers of children and old people, mingled with as many

dogs and chickens, all apparently living a happy, careless life.

Upon closer examination these surroundings might show either a thrifty, well-kept appearance, or shabbiness and lack of care. The planter's house might be in good condition or it might lack paint and a sound roof; some windows might be broken, while doors without latches and hanging by one hinge might open into poorly furnished rooms. The slave cabins were generally of logs, though neat board huts and even brick ones might sometimes be seen. They were perhaps twenty feet square and contained little except a table, a bed, and a few cooking utensils. These cabins were either neat and comfortable or unfit for even domestic animals to live in. One of the cabins was a nursery, where the babies whose mothers were working in the field were cared for.

The negroes were divided into two groups — house servants and field hands. The former were numerous in and about the mansion and the other buildings near by, one of which was the kitchen. Sometimes the house servants were neat in appearance and prompt and orderly in doing their work. Often they were slovenly and lazy, and had to be constantly scolded and threatened to make them attend to their duties.

All the slaves who were not house servants and had no special tasks, such as sewing or carpentry, were counted as field hands. Children over twelve years of age were expected to do some work, but this was measured out to them in small amounts at first and gradually increased as they grew older. In the case of the old people, the amount of their work was lessened as they grew

older, and finally they were allowed to stay about the cabins, where they were given such small jobs as they were able to do.

The field hands were roused before daybreak upon summer mornings by the ringing of a bell. They were obliged to cook their breakfasts and be in the field by sunrise or a little later. Here they were divided into "gangs," each in the charge of a "driver." The driver went into the field before them and divided it into plots, each of which was a "task" for one slave — that is, the amount that he must finish during the day. If the work was hoeing cotton, a certain number of rows was required, varying from one-half an acre to an acre. The driver, if harsh, generally had a whip in hand, which he flourished and sometimes applied. His voice was constantly raised to scold, threaten, or urge the work along. Upon another plantation, on the other hand, there might be a driver whose methods were not severe in any degree.

Plows and hoes were almost the only implements used on the plantation. These were heavy and clumsy. No other kind could be used, for as one of the planters said to a Northern visitor, "Such hoes as you use at the North would not last a negro a day." The plows were drawn by mules or oxen: horses could not stand the rough treatment and lack of care which they received from the common field hands.

One must not expect to find the work moving very fast during the hot summer mornings. The slaves had nothing to gain by working hard. They let their hoes fall in a listless manner and wasted much time turning the corners. At noon, dinner was brought to the field and usually two hours were allowed for rest, unless it

was the busy season. After the nooning the work continued until sunset. The slaves might then go to their cabins and cook their suppers. Each cabin had a fireplace where a huge fire that gleamed through the cracks between the logs of the cabin walls was soon burning. Each slave had for rations a peck of meal and three or four pounds of meat, generally bacon, each week. A little salt and sugar were added to this, and sometimes molasses. One suit of clothes (shirt and pantaloons) for winter and two for summer were given to each man.

Every negro family had a small patch of ground about its cabin in which to raise vegetables, and there was a chicken yard also. Often the slaves were allowed to sell vegetables, eggs, and chickens, and thus to earn money for themselves. This might be spent for fineries, or in some cases it went for liquor.

On Saturday, for either whole or part of the day, the slaves were released from field work and might work for themselves. In many cases they used this time and Sundays in which to earn money for themselves by hiring out and doing odd jobs. There were many instances in which slaves purchased their freedom and that of their families with money earned in this way.

The amount of work done in a day by the slaves is generally thought to have been about one-half that done by hired white laborers. But much depended upon the overseer of the plantation. If he was paid a salary, he might be easy with the slaves, in order to avoid trouble and to prevent complaints from getting to the master. But if the amount of his pay depended partly or wholly upon the crops, he would drive the hands, and if the master was absent from the plantation during the season,

the slaves might suffer severely in consequence. It was very hard for planters to get good overseers. They were usually young men who wished to earn money and get a start toward farming for themselves. They seldom stayed on a plantation more than a few years at a time.

As a rule, some whipping was necessary in order to get good work from the slaves. They were very lazy and used all kinds of excuses to escape their tasks. They often feigned sickness in such skillful ways as to deceive even the physician. Some planters commanded that slaves who did not complete their tasks should be flogged at the end of the day. Others would not permit this, and ordered the overseers and drivers to so lay out the tasks that the slaves could easily accomplish them.

Overseers were usually ordered to treat the slaves well and to keep them in good condition for work. The limit to the number of lashes that might be applied was sometimes fixed — it might be as low as fifteen or as high as fifty or more.

The condition of their clothing and cabins was inspected weekly. On Sunday morning there was roll call of the slaves. None was allowed to be absent from the plantation at any time without a written order from the master or overseer. The slaves were allowed, and sometimes obliged, to attend religious services on Sunday, and they frequently had their own preachers and conducted their own exciting services.

Did cotton production with slave labor pay well? Yes, on the large plantations; and when the price was good the profits were very large. On the other hand, when the price was low or the crop failed the loss was very heavy. Here was one difficulty with the system:

with slave labor the planter could not lessen his expense or turn to other crops. He was compelled to keep about the same number of hands and he must raise cotton. Moreover, between 1800 and 1860 the value of slaves



PICKING COTTON

rose from \$200 for a strong field hand to an average of \$1500 or more. The interest upon this money, then, should be counted as a part of the cost of slave labor. If the slave died or ran away, this money was lost. As he grew older his work was worth less, and finally he had to be supported and cared for. There was also much expense in the support of the negro children and for the services of a physician. The food and clothing given to an adult slave averaged about \$20 a year.

Considering all these expenses, besides the salary of the overseer, and considering also that the slaves did no more than half work, and that they damaged, wasted,

and stole much property, it can easily be understood that many planters thought slave labor more expensive than free labor. But even those who desired to do so knew not how to rid themselves of the slaves; there were no free laborers to hire, and the negroes, if freed, might become lawless and dangerous. Besides, a great many were actually not intelligent or industrious enough to support themselves at any occupation.

Many of the planters were successful and grew wealthy; others bought goods upon credit and were bankrupt most of the time. ~~X~~ When a good crop sold at a good price, the planter bought with his profits elegant furnishings for his house, fine carriages, handsome dresses, books, and music. These, and even his most common household furnishings, farm implements, and tools were bought in the North or from Northern merchants who imported them. It was fashionable, as well as agreeable, for the planter's family to spend the summers in Newport or Saratoga. Often the planter was absent from his plantation, except for brief visits, leaving it in charge of his overseer. Or, he might own several plantations, living only occasionally upon any one of them. But all the profits of the successful planter were not spent for living; with the surplus he often bought more slaves and more land. ~~X~~

The fact that land was being constantly worn out and that new land for cotton culture was always sought kept population scattered in the South. Towns were few and small because there were few other industries besides farming. On the plantations one might find slave carpenters, joiners, blacksmiths, weavers, etc. But there were not very many men who were anxious to build

up factories by borrowing the surplus capital earned by the planters. It was thought that this capital must go back into slaves and land in order to "raise more cotton" and thus to make more money with which to buy more slaves and land again.

Because population was scattered in the South, the people of any locality could not afford to build good roads and bridges. Most of the cotton could be shipped down creeks and rivers to the ocean and gulf ports; hence, railroad building was slow. The thinness of population resulted also in there being few public schools; the planter's sons often went North to college. Churches and public libraries were not convenient, and newspapers were not plentiful. In consequence the wealthy planter's life lacked many of the comforts and conveniences that one might expect to see in the homes of those who had much less money to spend. *

The ill effects of having one great crop instead of a variety, and of having negro slave labor instead of free white labor, were not confined to the great planters. They could raise cotton at a lower cost per pound than the small slave holder or the farmer without slaves, because they produced it upon a large scale. The large planters could therefore buy up any rich land held by the other farmers; hence the latter gradually came to own the poorer lands. They were therefore less prosperous, on the whole, than the large planters, and had fewer of life's comforts and luxuries. Those who had but one or a few slaves worked with them in the fields. On the whole, the slaves were treated better under such conditions than when they worked together in large numbers under an overseer.

There was a large class of small farmers in the South who owned no slaves. Upon them the system of slavery had a bad effect. It not only caused them to take the poorer lands and those so located — perhaps in the mountain regions — as to be away from the main lines of travel; but it seemed to take from them the ambition to better their condition. They saw that trying to become large planters was hopeless. They could make no progress by raising other crops for sale, because there were few markets for their produce, and very poor means of getting it to such markets as existed. Because of the sparseness of population, poor means of communication, and lack of towns, schools, and newspapers, there was little to stimulate these people to be progressive and energetic in their farming.

The large plantations did not set an example in scientific methods or in the use of improved machinery. The small farmers were, therefore, as a class, satisfied to raise enough corn, pork, tobacco, and cotton for their own use, with a small surplus with which to pay for tea, coffee, and sugar. Their clothing was almost entirely homespun, their household goods were homemade; even their wagons (except the Northern-made wheels) and harness were patched together on the farm. In fact, the poor-farmer class of the South lived much like the pioneers of the early times in the West, with the crudest of surroundings; but they were also without the ambition to gain a better living, or to give their children better advantages.

Under these circumstances it is not surprising that agriculture in the South was very backward. There were no improved breeds of live-stock in the cotton States,

except among the horses on the large plantations. The average yield per acre of corn and small grains was very low. Considerable amounts of flour, meats, and hay were imported from the North. There were few agricultural societies, and the majority of planters and farmers were untouched by the ideas of improved agriculture that were beginning to spread elsewhere in the country.

CHAPTER XVII

AGRICULTURE AND THE CIVIL WAR

WE must look to the history of agriculture in this country for one of the fundamental causes of the Civil War. It is possible to see, in this history, how the two sections, North and South, were gradually growing unlike each other. This was especially true after the spread of cotton culture. When this crop became very profitable, the people of the South went ahead blindly, wherever the land was adapted to it, putting into it the greater part of their time, labor, and capital. Naturally, they made use of the supply of laborers that was at hand — that is, negro slaves. As with tobacco and rice previously, so now with cotton, the large plantations had the advantage over the small farms. Thus cotton culture fastened slavery and the large plantation system upon the South, and kept that section, agriculturally, in a condition quite like that of colonial times. The small farmers and poor whites lived and worked their farms in very much the same way as the pioneers of earlier days; the large planters formed an aristocratic class that led the rest of the people in political and social life.

In the North, on the other hand, there were small farms everywhere, almost all worked by their owners, who raised a variety of crops. Many farmers, in order to make the best use of their land, were led to experiment,

to fertilize, and in other ways to adopt new and better methods of farming. They began to buy new machinery and to pay attention to the raising of stock. At the same time commerce and manufacturing were growing in the North; this gave the farmers good markets and made them prosperous. ×

Now, the significant fact about cotton culture with slave labor was this: that it must constantly go on to fresh land in order to be profitable. There could be no rotation, for there was not a variety of crops. Stock could not be kept as a means of retaining the fertility of the land; for slave labor could not properly care for it, and there were few markets for dairy products in the South. It was necessary, therefore, if the great planters were to prosper, that they should be able to move farther west with their slaves when their lands became worn out or too expensive. This fact led to settlement beyond the Mississippi and to the admission of Missouri as a slave state in 1821. The same need for new land was one of the causes leading to the annexation of Texas, and cotton-growing was expected to spread to California.

It was soon discovered, however, that cotton could not be grown west of Texas. A few years later, in 1854, Senator Stephen A. Douglas of Illinois proposed a law that was enacted by Congress, under which the planters were allowed to take their slaves into the territories north of the parallel 36° 30' if a majority of the people there voted for it when new States were formed. This was the Kansas-Nebraska bill, which repealed the Missouri Compromise, mentioned in a previous chapter. Of course, this arrangement pleased the Southern leaders. They had already foreseen the time when cotton lands

would be scarce and expensive. They did not like the opposition that arose in the North to Douglas's bill.

The view of the Southern planters is expressed very well by one of them, who wrote in a letter to a friend in New York State as follows: "What if we do want all the territory for our niggers? You know that we will be crowded here after a while, and what then? Can we work them to advantage if we fail to get our share of the uninhabited lands? So soon as they become unprofitable to us, we will have no use for them. The Southern planters are like the army worm. They are destroying the soil as fast as they can. Some of them have already worn out two farms, and by the same course you know our country will become poor and then we must move west and clear more land. Sometimes our negroes run away; sometimes they are badly treated; sometimes they treat their owners badly. I do not doubt but they are better off where they are well treated than if they were free and in New York. They cause men to commit sin, and they are certainly a great aggravation; but what could we do with them? There is not one in fifty that would, if free to-morrow, make a living. Some are even too lazy to steal. You know that I am lenient to mine. I give them time to make their own crops; and frequently I have to compel them to work them after planting. Then for the good of the slaves, I say, let us carry them wherever we can make money out of them, so that we may never have them settled too thickly in any one State."

The Republican party was formed in opposition to this idea of extending slavery into new territories from which it had previously been excluded. This party grew very

rapidly. The Southern leaders thought it aimed not only to restrict the spread of slavery, but to abolish it entirely. When, in the election of 1860, the Republicans elected Abraham Lincoln President, the Southern leaders knew that the movement of slavery would be checked. So they determined to secede from the Union, and this brought on the Civil War.

The rank and file of Confederate armies was made up chiefly of the small farmers of the South. Many of these had no interest in slavery, but they were determined to resist the invasion of the South by Northern armies, and to uphold the right of secession. We must now inquire, how did the war affect Southern agriculture?

It had been the proud boast of the people in that section that "Cotton is king." They thought that the cotton-mill owners of the North and of England would not be able to do without the raw material. They expected that by the sale of their immense cotton crops, of which they exported \$200,000,000 worth in 1860, the Confederate government would be able to raise taxes and to support armies. But, as soon as the United States government could get naval vessels ready, these were stationed outside the various ports of the South, to prevent merchant vessels from going out. Thus, by the "blockade," the exportation of cotton was prevented, except in small amounts that were carried out by "blockade runners." The people of the South could not sell their cotton, and hence could not pay taxes. The Confederate government could not obtain enough money, either by taxes or by borrowing, to support its armies. These facts go far to explain the defeat of the South.

✓ On the plantations, from every one of which the men

and large boys went into the Confederate armies, the work went on as usual. The slaves were faithful to their mistresses and offered them no harm. One must realize that before the war not enough food products had been raised in the South to supply its needs. Now that the supply from the North was cut off, there was great suffering, especially in the cities. On some plantations it was agreed to raise less cotton and more corn. Of course, the supply of Northern manufactures, and of coffee, tea, and sugar was cut off also. So the women wore homespun dresses and coarse leather shoes. They made "coffee" of peanuts and potatoes, and "tea" from blackberry and holly leaves. Often, the women and children at home, as well as the soldiers at the front, suffered keenly from hunger and cold, as the dreadful war shut the South off more and more from the rest of the world.

What was the condition of agriculture in the North during the war? When cotton goods became scarce, more flax and hemp were raised. For use instead of cane sugar, people made more maple sugar, and they increased the supply of honey by keeping more bees. They also tried to raise sugar beets, but were not successful. Because of the high price of sugar, a new product — sorghum — which had been introduced a few years earlier, was raised in the Northwest. From it was made a sirup that took the place of sugar.

The proportion of farmers going into the army was not so large in the North as in the South, for the North was more populous. But on many farms, when the men left, the burden of work fell upon the women, aided by the boys and girls. Many women did not hesitate to go into the fields to do the men's work. Said one girl, who

was binding grain, "I tell mother that as long as the country can't get along without grain, nor the army fight without food, we're serving the country just as much here in the harvest field as our boys are on the battle-field — and that sort o' takes the edge off this business



WOMEN WORKING IN THE FIELDS IN WAR TIME
Sketch by Thomas Nast, in F. B. Goodrich, *The Tribute Book*.

of doing men's work, you know." A missionary living in Kansas wrote as follows: "Yesterday I saw the wife of one of our parishioners driving the team in a reaper; her husband is at Vicksburg. With what help she can secure and the assistance of her little children, she is carrying on the farm. In another field was a little boy of ten years; and in another a girl of about twelve." In the course of their work the women cut the hay and grain, and bound and threshed the wheat and oats, besides chopping and hauling wood and building fences.

Several conditions helped Northern farmers to remain prosperous during the war. First, the army needed enormous amounts of food; the demand for uniforms

and blankets greatly stimulated the production of wool; and quantities of hay and feed were needed for army horses and mules. In consequence, the prices of agricultural products were good. Second, before and during the war many thousands of immigrants, chiefly Germans and Irish, settled in the North; these immigrants added somewhat to the labor supply, and many took farms for themselves. Third, the newly-invented farm machinery, described in Chapters XIII and XVII, enabled the farmers to accomplish much more work than could have been done otherwise. In 1863 the loyal States raised as much wheat as had been raised by the entire country four years before. In fact, it has been said that the reaper decided the Civil War, for it enabled the farmers to raise the grain that made them prosperous and able to pay taxes. \

During some of these years great quantities of grain were shipped to England, when the crops in that country were short and when the danger of European wars threatened to cut off the supply from other places. The South had expected that, when the blockade cut off the supply of cotton from the great mills of England, the government of that country would take some decided action favorable to the South. Indeed, this came near being the fact. But England knew that in case of war with the United States, she would cut off her own supply of wheat; this, among other things, made her hesitate.

\ In the midst of the war (1862) Congress enacted a law that has had great influence upon our agriculture, namely, the Homestead Law. Instead of requiring the payment of \$1.25 or more an acre, this act gave land *free* to settlers who would live upon it for five years. Any citizen (or person who had declared his intention to become a

citizen) over twenty-one years of age was entitled to 160 acres. Soldiers could deduct from the five years their term of service in the army. X

It will be remembered that under previous land laws (see pp. 112-114) the government had sold its land to settlers, the idea of giving it away having met strong opposition. The question had been debated in Congress at various times for forty years. Some opposed the free land policy because they thought the government needed the revenue; others because, they said, it encouraged undesirable immigrants. Before the Civil War free homestead bills had been opposed by Southerners, because they saw that such a law might stimulate the settlement of Northern farmers in the West; and thus "free territory" would become populated and ask for admission into the Union faster than "slave territory." President Buchanan had vetoed a bill that required the payment of only twenty-five cents per acre. After the Southern members had withdrawn from Congress, the law providing for free homesteads was passed without difficulty.

X While the war was in progress 2,500,000 acres were given away under the Homestead Law; this made over 15,000 farms of 160 acres each. New railroads were built farther west, and thus the new crops furnished the manufacturing cities, the armies, and Europe with abundant food. During the same years the cheap lands that had been granted to railroads were also put up for sale.

~ It is also important in this connection to know that during the decade preceding the Civil War railroads had been built as far west as the Mississippi River at

several points. When, therefore, the lower Mississippi was closed to navigation and the Northern farmers lost their Southern markets, these east-and-west lines were the means of carrying their products to the Atlantic coast cities. There could be little of such want and suffering in the North as existed in the South while these influences were at work helping to make men prosperous.

Enough has been said to show how important our agriculture was in bringing about the conditions that caused the Civil War, and in helping to determine which side should be victorious. North and South became enemies largely because of the different industrial systems that prevailed in the two sections. As time went on, the agricultural system of the North was bound to come more and more into conflict with that of the South. Moreover, the war showed clearly the weakness of Southern agriculture, as it was then conducted; while agriculture in the North strengthened the Union forces and enabled them to prevail.

CHAPTER XVIII

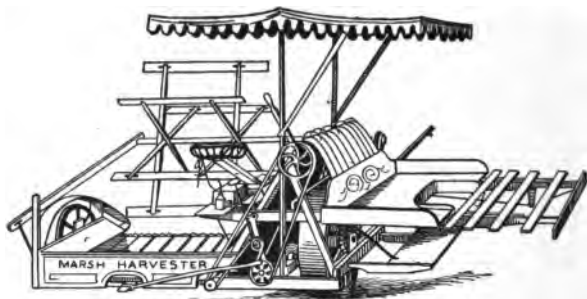
THE WESTWARD MARCH OF WHEAT

As the farmers of the North Central states moved into the "oak openings" and out upon the broad prairies, wheat soon came to be their principal crop. There were several reasons for this, the first being that the soil and climate were naturally adapted to wheat. The prairie fires had left behind ashes that furnished the soil with phosphates. Then, too, little labor was required to raise a crop like wheat, that needed no cultivation. This crop was easily handled by machinery, both during and after the harvest. The wheat might be used immediately on the farm; or it could easily be kept for a good market. In the early times of prairie settlement, wheat usually commanded a good price in cash. Indeed, it often took the place of money. When the farmer had stored his wheat in a warehouse, he received tickets that were as good as cash. It is not strange, therefore, that wheat-growing spread very rapidly through the Western states.

Land was cheap, and after the Homestead Law, cost practically nothing. The reaper and thresher enabled farmers to cultivate large fields, while the railroads reached far to get the golden harvests. In fact, the amount that could be raised was limited only by the amount that could be harvested before it spoiled in the field.

But the back-breaking work of binding by hand was slow and tedious. This fact led many inventors to work

upon improvements that would enable the farmer to harvest his grain more rapidly. Finally, in 1858, two brothers, C. W. and W. W. Marsh, living near DeKalb, Illinois, patented the "Marsh Harvester." Two men were stationed upon this machine to bind the grain as it was cut and delivered to them upon a table from an



THE MARSH HARVESTER ¹

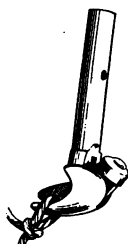
At the right are seen the platform upon which the binders stood, and above it, the table where the grain was bound.

endless apron. Of course, the inventors had the usual struggle to introduce their new machine. On one occasion, in order to convince some doubters, the inventors allowed a girl to bind on the machine to show how easily it could be done. Before this, it required from four to six men to bind by hand and to shock the grain cut by a reaper, at the rate of ten or twelve acres a day. Now, two men and a driver, the latter often a boy or a woman, could do nearly as much work in the same time. So the wheat fields expanded still farther. ✓

But inventors were not satisfied until they could make the reaper itself bind the grain. In 1858 John F.

¹ From C. W. Marsh, "Recollections 1837-1910." *Farm Implement News*.

Appleby of Palmyra, Wisconsin, then a boy eighteen years of age, made the model of a machine that would tie a knot. But he went to the war before he applied his idea to the binding of grain. After the war, binders that used wire for holding the sheaf were patented, and quite generally adopted in the West. But they were not satisfactory. The wire was too expensive. Threshers, too, found great difficulty in cutting the wire bands and keeping them out of the threshing machine, where they did much damage. Further, in spite of the best of care, pieces of wire got into the grain, causing damage to the mills and injury to the stock that ate the straw. Hence there was a great demand for a binder that would use twine. In 1878 Appleby finally succeeded in placing upon the market his "twine binder." Parker and Stone, of Beloit, Wisconsin, made the first of these machines. One man driving the machine could accomplish all that eight men had formerly done with the reaper. So, the wheat fields became still more vast. It would now be impossible, without this machine, to reap the enormous harvests of our Western prairies.

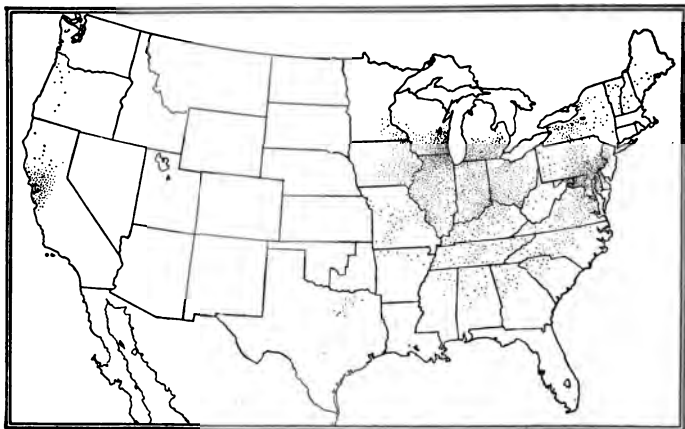


APPLEBY'S
KNOTTER ¹

All the influences that have been mentioned tended to keep the wheat belt moving westward through Illinois, Wisconsin, and Iowa, on to Kansas and Nebraska, and Minnesota and the Dakotas. Other forces worked toward the same result. These Western farms were larger than those in the East, so the improved machinery (steam plows, twine binders, etc.) could be used to better advantage. That is, a farm could be large enough to keep

¹ Courtesy F. B. Swingle, *The Wisconsin Agriculturist*.

a complete outfit of these machines busy during the season when each could be used. In the older States, farms had been laid out before these inventions were made practical, and were consequently smaller. Their owners could not afford to buy the best machinery.



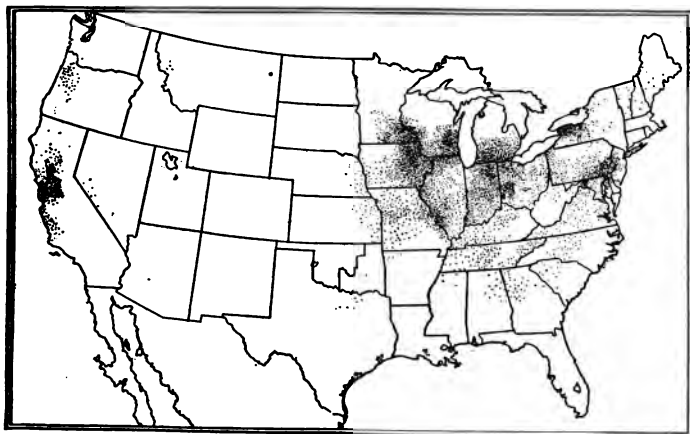
AREA OF WHEAT PRODUCTION IN 1860 ¹

The total crop had doubled since 1840.

The rapid building of railroads to the West also helped to urge on the movement of the wheat belt. The fact of distance from the markets of the East and of Europe now made less difference, because wheat is a product that can be kept for months and that will bear carrying long distances. Because it has also higher value in small bulk than the other grains, the payment of freight charges affects it less. The Western railroad companies received from the United States government great grants of land to aid them in the expense of construction. These lands

¹ This and the three maps that follow are reproduced from the *I. H. C. Almanac, 1911*, with the consent of H. C. Taylor.

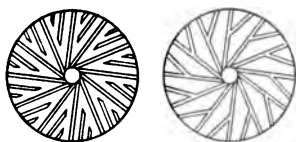
they offered for sale at low prices. Besides issuing much attractive advertising matter, the companies sent agents among the farmers in the older states, to induce them to go West. They ran homeseeker's trains and in other ways encouraged the settlement of the tracts through which their new lines were built.



AREA OF WHEAT PRODUCTION IN 1870

In addition to the new farm machinery already mentioned, two improvements in methods of grinding wheat into flour had great influence upon the history of wheat in the United States. Throughout our history, until this time, most of the flour was made in small "gristmills" scattered by thousands over the country. Wherever the pioneer farmers settled, there went the miller. He ran a dam across a rapid creek and soon had his mill-race dug and his water-wheel turning. The wheel turned the mill-stones that ground the farmers' "grist." The stones were set close together and were revolved rapidly so as to

make as much flour as possible in one grinding. But there was a serious fault in this process. Between the



SURFACES OF MILLSTONES

Upon the surface of each stone furrows were made, which cut the kernels of grain. The smooth surfaces between the furrows crushed the pieces into meal. The grain was fed into the center of the stones and the meal ran out to the edges along the furrows.

outer "bran" coats of the wheat kernel and its inner starchy heart are layers containing gluten that is excellent for food. This material was not ground into the flour by the millstones, but came out in the "middlings," which also contained much bran, and sold for a low price. How could this valuable material be saved?

The difficulty was solved by Mr. E. W. LaCroix, a Frenchman, who got ideas upon this subject from his native land. He was employed at Minneapolis and in 1870 made a middlings "purifier" that revolutionized the milling process. The first grinding was now made so that as little flour and as much middlings as possible would be ground. The middlings were next put through the purifier, in which they were sifted, an air blast being used to separate the bran from the particles of good material. Then the middlings were ground again. By several regrindings much more good flour was obtained than previously had been the case. This was called the gradual reduction process.

But a still greater effect followed. By the old process, winter wheat had made the best flour and had been chiefly used. This was because spring wheat flour when made in one grinding contained dark particles, and the flour made dark, and often sticky, bread. The purifier now enabled the millers to make fine white flour from

hard spring wheat. This was especially favorable for Minnesota and Dakota farmers; for here spring wheat was the principal crop, because winter wheat was in danger of being killed by the extremely cold winters when there was little snow, or when the fields were blown bare by the high prairie winds. This invention, then, greatly increased the value of Minnesota and Dakota spring wheat.

It is interesting to note that LaCroix, like several other inventors whose stories have been told, got no money for his ingenuity. Other men patented similar machines, and he was unable to realize the reward that he deserved.

Another improvement in milling came at about the same time. This was the use of rollers instead of stones for crushing the kernels of grain. The idea was adopted from Hungary by the Minneapolis millers, Pillsbury, Washburn, and others. They simplified the foreign machinery. At first glass, porcelain, and marble rollers were tried; and finally the modern steel roller came into use.

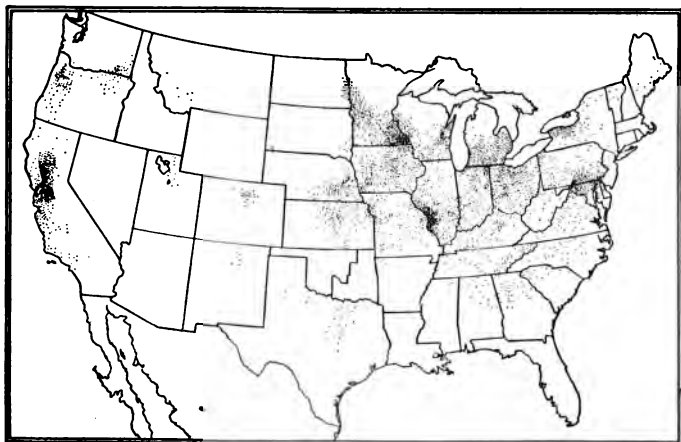
In the ways described it was found that the hard spring wheat of the Northwest could be made to yield the best "patent" flour. This fact gave an immense stimulus to the movement of farmers into Minnesota. There the broad prairies came under the plow with great ease. Said a paper in 1877, "The grand land craze caused by the immense yield of wheat in Minnesota does not abate, but on the contrary increases daily. . . . People appear to be coming from all parts of the Union to get a slice of Minnesota lands."

The progress of wheat-raising did not stop here, but swept onward into the great Red River Valley of Dakota. The rich, level land of this valley could not be excelled for wheat production. Besides, the climate was well

adapted to this product. While the summers are short, the days are very long, owing to the high latitude; this gives a total amount of sunlight that is favorable for ripening the grain. Further, the nights are cool, and during the period when the kernels are maturing there is not such intense heat as there is farther south. The extremely cold winters cause the frost to penetrate deep, and during its gradual thawing in the spring the soil retains its moisture, to the advantage of the growing crop. For these reasons wheat became the single great crop of this region.

The question then occurred to some, why not raise it upon a larger scale, and so make its production still more profitable? In the East a farm would be thought large that contained an entire section (640 acres); but farms in the Red River Valley of Dakota that contained one, two, or three sections were called "small" after the development of the "bonanza" wheat farms. Thousands of acres were included in each of these great farms. The immense fields were plowed by a dozen or a score of sulky plows driven in a squad. The seeding was done in the same manner. When harvest time came, a score of self-binders, of the latest improved type, circled like a fleet of ships around the sea of ripened grain. While in 1880 Dakota produced less than three million bushels of wheat, by 1885 its product was thirty-eight million, and in 1887 it was more than sixty-two million bushels. The most famous of the "bonanza" farms was the Dalrymple farm, in which 55,000 acres were included. It was divided into tracts of about 2000 acres. Each tract had a superintendent, separate buildings, machinery, and account books.

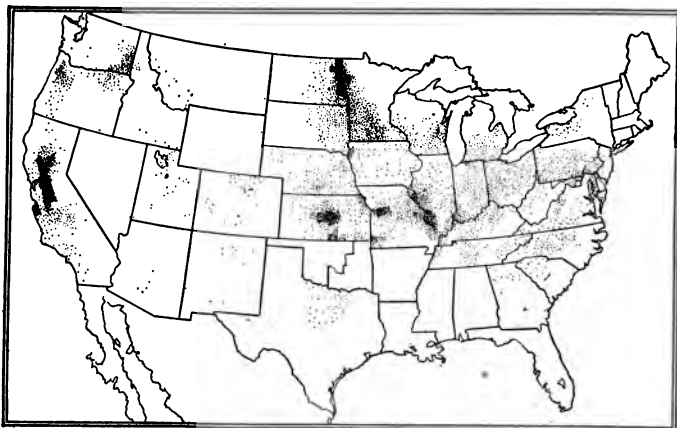
Before many years it was discovered that these great farms were not as economical as smaller ones. As more people flocked into Minnesota and Dakota, land became more valuable. As its price advanced the farmer felt that he had more money invested in his land, and



AREA OF WHEAT PRODUCTION IN 1880

that he must therefore get a greater yield from it. He knew that, in order to realize this greater profit, he must cultivate more carefully and must add stock and vary his crops, so as to keep the land in good condition. The small farmer could do this better than the large farmer. This was partly because the former, in tilling his own fields, and managing other parts of the farm work, took more pains and looked after the details better than the hired laborers of the large farms. So it came about that the small farmers could afford to buy parts of the bonanza farms and the latter were broken up.

One effect of the great farms of the Northwest may be seen in the development of machinery. The sulky plow had been invented earlier, but it was first extensively used upon the Western wheat fields. For these fields, too, manufacturers made gang plows, disk plows and harrows, twelve-foot seeders, and large steam threshing



AREA OF WHEAT PRODUCTION IN 1890

machines. Grain elevators came into use in the wheat region and saved the farmers the expense of building granaries for themselves.

Let us now look in another direction to see the progress of the advancing line of farmers in Kansas and Nebraska. In Chapter XI it was told how hardy pioneers, mainly from Kentucky and Tennessee, advanced up the valleys of the Missouri River and its tributaries. As early as 1830 the frontiersmen had reached its great bend on the western border of the State. For twenty years they did not venture beyond into the region we know as Kansas.

There were several reasons for this. In the first place, this was "Indian Country." The tribes living east of the Mississippi had one after another been persuaded or forced to give up their hunting grounds and to take others in the Far West. Another reason why the spread of population was checked at this point was the remarkable tradition that between the Missouri River and the Rocky Mountains the country was unfit for habitation! Here lay the "Great American Desert" that is shown on the maps of those days. This fiction had its rise in the reports of travellers who crossed the plains, especially in the account given by Maj. Stephen Long, who made the journey in 1819-1820. He prophesied that this region would certainly be a barrier to all further spread of our population, and he argued that this would be a good thing for the country. Other strange stories were believed: that the prairies where no trees grew would not support grains; that the soil was sandy and full of pebbles, like that of a desert.

But eastern Kansas was entered in the early fifties, and it is at this time that we learn of the great debate over the organization of Kansas and Nebraska as territories. The Kansas-Nebraska bill, opening all this region to farmers who had slaves, became a law in 1854. Its result was to hasten the coming of both Northern and Southern men, each group eager to outvote the other on the question of slavery; for, it will be remembered, this question was to be left to a vote of the people. The New England Emigrant Society sent settlers from the North to Kansas and aided them to pay their expenses. This society also furnished leaders and helped in the establishment of stores, mills, and small factories. In spite

of this encouragement many Northern emigrants to Kansas became discouraged, and some returned to the East.

From Missouri came some farmers and a few planters with their slaves; but there were "border ruffians" also, who came only to vote and to terrorize the "free men." These two factions came to blows, and bloodshed and the burning of towns resulted. When the Civil War began, many of the Kansas settlers entered the army. Emigration there was checked, and no progress was made for several years.

After the war, the movement of farmers to Kansas and Nebraska became very rapid. By deducting their term of service from the five years' residence required, soldiers could get homesteads quickly. Railroad building was making rapid progress in these states, and the companies were holding out strong inducements to settlers. The latter were nearly all poor people, who came with few tools and implements and little household furniture. Many lived for the first years in "dugouts," instead of in log cabins, for timber was not so plentiful as it was farther east, and the prairie sod was thick and tough. In building a dugout, an excavation about 12 by 14 feet in size was made in the side of a hill. In each corner was set a heavy forked timber, and poles were laid upon these, across the four sides. Split logs or lumber were then laid upon the poles, upon which the thick sod rested and formed a solid roof. Sometimes a piece of canvas was stretched beneath to form a ceiling. The floor might be of puncheons, or of dirt pounded hard and covered with corn husk mats. The sides of the dugout were built up of sod, though the front was often of logs

or stone. Not infrequently the entire hut was built on the level prairie with sides and roof of sod.

In these temporary homes, with homemade furniture and few comforts, many a prairie farmer and his wife began their struggle for a better life. Soon the dugouts gave place to neat white farmhouses. For crops were abundant; the "sod" or "breaking" crop of wheat or corn

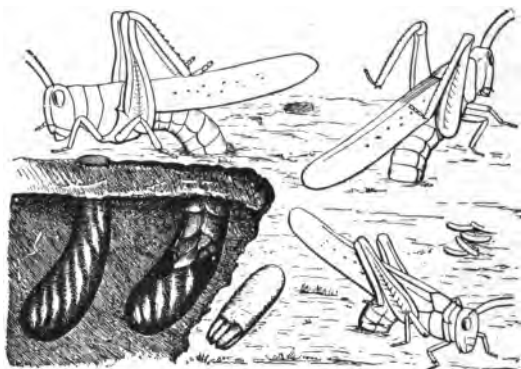


A SOD HOUSE

often paid for the land. Then, because there was little clearing to be done, the farmers enlarged their acres rapidly, and soon became well-to-do. Like their brothers of the North Central states, the Kansas or Nebraska farmers of the seventies broke hundreds of thousands of acres of wild land each year and sowed them to wheat. These were the years of the great Kansas "boom." The success of the early comers gave rise to exaggerated reports of the ease with which any farmer might get rich, so the settlers swarmed out upon the prairies in increasing numbers.

But all was not ease and plenty on these western prairies. In no other large section of the country, perhaps, have farmers suffered so many afflictions. As elsewhere, the Indians were sometimes troublesome. Both before and after 1870 there were sudden attacks and massacres, many farmers and their families losing their lives. Then there were the prairie fires and the terrible winter blizzards, which not only brought serious damage to stock and crops, but also entailed much suffering and loss of human life. The years of drought that came at

different periods ruined and discouraged thousands of farmers. For weeks at such a time the sun burned from a cloudless sky; a scorching wind made the grain wither; the leaves of cornstalks curled and turned brown; and the grass dried on the parched and cracked prairies.



ROCKY MOUNTAIN GRASSHOPPER OR LOCUST

Perhaps the most dreadful affliction was the plague of locusts, or grasshoppers (1874). Out from their breeding places in the foothills of the Rocky Mountains they came in clouds that darkened the sun. They settled down upon fields, woods, and pastures, leaped over streams and rivers, swept into every fertile place, and everywhere left a desolate waste behind them. There was nothing left for man or beast to live upon! Hastily the family and the household goods of the poor man who could not afford to buy food were bundled into the canvas-covered moving wagon that perhaps had brought them to their Western farm, and the long journey "back home" was begun. Supplies were sent from the East to support

many of those who stayed. Such were some of the hardships of pioneer life on the great plains.

^X What a story is this — the march of wheat halfway across the continent! In 1800 Washington's plantation was in the greatest wheat-producing region of the country. In 1825 this region was still in the East, stretching from the Mohawk Valley, in New York, southward along the mountain valleys of Pennsylvania and Virginia. By 1850 it had well started upon its rapid journey across the Ohio River Valley and the plains beyond. In the decade of the Civil War it leaped the "desert" and mountain barrier, and California and Oregon also began to be centers of wheat growing.) Next, the prairies of the Far West responded to the touch of the plow, and such a golden stream of wheat as never before had been dreamed of began to flow eastward along the railway arteries to the hungry peoples of the East and of Europe.

CHAPTER XIX

HARD TIMES FOR FARMERS

THE rapidity with which the West was settled is the most noticeable fact about the period of our agricultural history that includes the two decades following the close of the Civil War. The effect of railroads, free lands, and open prairies was to make the farmer's frontier move across the Western states ten times as rapidly as it had moved across the wooded region behind. Thousands of immigrants from Europe flocked to the New West. It is at this time that the stream of Scandinavian immigrants became particularly large. There are in the Dakotas whole counties that were almost completely settled by farmers within a single year.

On these prairies the farm homes were scattered wide distances apart. A comparison with rural conditions elsewhere will aid us to understand the situation.

"The European farmer lives in a village, where considerable social enjoyment is possible. The women gossip at the village well, and visit frequently at one another's houses; the children find playmates close at hand; there is a school, and, if the village be not a very small one, a church. The post wagon, with its uniformed postilion merrily blowing his horn, rattles through the street every day, and makes an event that draws people to the doors and windows. The old men gather of summer evenings to smoke their pipes and talk of the crops;

the young men pitch quoits and play ball on the village green. Now and then a detachment of soldiers from some garrison town halts to rest. A peddler makes his rounds. A black-frocked priest tarries to join in the chat of the older people, and to ask after the health of the children. In a word, something takes place to break the monotony of daily life. The dwellings, if small and meagerly furnished, have thick walls of brick or stone that keep out the summer's heat and the winter's chill.

"Now contrast this life of the European peasant, to which there is a joyous side that lightens labor and privation, with the life of a poor settler on a homestead claim in one of the Dakotas or Nebraska. . . . On every hand the treeless plain stretches away to the horizon line . . . the new settler is too poor to build of brick or stone. He hauls a few loads of lumber from the nearest railway station, and puts up a frail little house of two, three, or four rooms. . . . In this cramped abode, from the windows of which there is nothing more cheerful in sight than the distant homes of other settlers, just as ugly and lonely, the farmer's family must live. . . . Each family must live mainly by itself, and life, shut up in the little wooden farm-houses, cannot well be very cheerful. A drive to the nearest town is almost the only diversion. There the farmers and their wives gather in the stores to enjoy a little sociability."¹

It is not surprising that under these circumstances life was barren; that farmers nursed their grievances, and that many women, particularly those from the farm villages of foreign countries, suffered much from homesickness.

¹ E. V. Smalley, in *Atlantic Monthly*, 72: 378.

Reasons have been given elsewhere why the principal crop at first in the Middle and Far West was wheat. What were the results of this excessive wheat raising? In European countries grain growers suffered severely from American competition. One can readily see, also, how the cheap Western wheat and flour took away the profits of Eastern farmers. The New England, New York, and Pennsylvania farmers now turned to raising other crops, such as fruits and vegetables, or to dairying. Many landowners abandoned their farms and moved to the cities, where factories were growing rapidly, and many went to the West.

Like the tobacco and cotton growers of the South, the wheat growers of the West took little account of the effect that must follow the production of a single crop for many years in succession upon one piece of land. But the time came when the land would yield only one-half or one-third as large crops as it originally did. As the wheat belt moved on, it left in its wake worn-out fields that made necessary more careful tillage and greater attention to more varied and scientific agriculture.

Thus one good result came from the mistakes and misfortunes of the wheat growers. Farmers were obliged to study into the causes of their troubles. They organized agricultural societies, read more agricultural papers, and began to learn scientific agriculture. This, of course, led to the conclusion that raising mixed crops in rotation, and, above all, dairying, were the means of salvation for Western farms.

Several reasons have been cited why the farmers of the West were at different times meeting disappointment in their grain fields, and others may now be stated.

Throughout the history of our agriculture the farmers who settled first in a new region were quite likely, when a chance came, to sell their farms and move on to cheaper lands. A family might make several successive moves. These farmers did not expect to get much more than a living from their crops; for the real profits of their farms they looked to the *increase in the value of their land*. It is quite natural that careless cultivation should result from this condition. Moreover, many farmers "bit off more than they could chew"; that is, they took up larger farms than they could pay for and were disappointed in the expected increase in their value.

There could be but one result when this happened, or when the crops failed,—debts and mortgages. During the "boom" times not only did farmers find it easy to borrow money; sometimes they were even sought out and persuaded to borrow by the agents of Eastern capitalists, who would thus make a profit. The fever of speculation affected the railroads, the town builders, and the bankers quite as much as the farmers. Everybody was willing to pay too much for what he bought and all thought it wise to go into debt in order to make more money. But every "boom" is followed by a reaction: failures, debts, and discouragement are the final outcome. It will readily be seen that such alternations from "flush times" to "hard times" as occurred between 1870 and 1895 are not a sign of healthy agricultural life. In the later chapters of this book reasons may be found for believing that we have forever passed the time when these conditions can be possible in any large section of the country.

In the periods of depression that have been described,

Western farmers had other grievances that may now be stated. If we should study the history of manufactures and commerce in the period that followed the Civil War, we should see that these industries were progressing at



THE ADVANCE OF POPULATION IN
THE WEST, 1860-1870

a very rapid rate. It is true that they experienced "hard times" also, as the crisis of 1873¹ gives evidence. But the farmers felt that they were falling behind in the race.

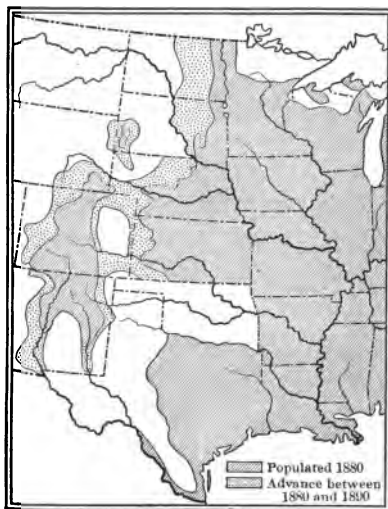
Besides, the farmers generally thought that they were being wronged in several ways. They believed that the grain and cattle buyers of the cities were offering them too low prices and making too large profits.

At one time when Iowa

farmers were burning their corn for fuel it was worth a dollar a bushel in certain Eastern cities. Those who had borrowed money felt that interest rates were too high, and they were made bitter by the foreclosing of the mortgages upon their farms. They saw the government favoring manufactures by high tariffs that were not reduced after the need for them caused by the Civil War had passed.

¹ See James and Sanford, *American History*, 444-445. The conditions in agriculture and other industries referred to in the present chapter are also described on pp. 451-456.

The greatest grievance that the farmers had in these years is found in the fact that the prices of their products were steadily falling. This was due chiefly to *over-production*. The rapid advance of population over the prairie lands of the Middle and Far West has been explained. This was encouraged by the free land policy of the Homestead Law; and it was further made possible by the rapid spread of the network of railroads. It came about for these reasons that farm products increased faster than the demand for them. The fall of prices was the natural result.



THE ADVANCE OF POPULATION IN
THE WEST, 1880-1890

Another reason for the decline of prices is connected with the money supply of the country. During the Civil War the government had issued much paper money, with which it paid war expenses. This had fallen in value, as people hesitated to take it in exchange for goods; and this fact caused prices to rise. When the war was over it was decided to redeem the paper money in gold, and it became more valuable; that is, less of it was given for a bushel of wheat or corn. This meant that the prices of farm products fell greatly, as will be seen from the table on the following page.¹

¹ The figures are taken from the Statistical Abstract of the United States for 1894.

Year	Corn per bu.	Wheat per bu.	Cotton per lb.	Salt Pork per lb.	Sugar per lb.	Butter per lb.	Tobacco per lb.
	Dollars	Dollars	Cents	Cents	Cents	Cents	Cents
1870	.925	1.29	23.5	13.2	12.6	29.3	11.4
1875	.848	1.12	15.	10.1	10.8	23.7	11.3
1880	.543	1.25	11.5	6.1	9.0	17.1	7.7
1885	.54	.86	10.6	7.2	6.4	16.8	9.9
1890	.418	.83	10.1	6.0	7.0	14.4	8.6
1894	.46	.67	7.8	8.0	4.4	17.6	8.5

Many farmers felt that the money policy of the country was being determined by a set of rich men in the Eastern cities, who purposely oppressed them. They wished the paper money of the country to be continued and even increased, and joined the "greenback" party that hoped to bring this about. But perhaps the greatest amount of complaint was made against the railroads. "Freight rates," said the farmers, "are too high; there is nothing left for us after the freight is paid." It happened too often that the railroads lowered their rates for the cities and then made up their loss by charging high rates in small towns where the farmers shipped their grain.

All of these grievances led to the formation of various farmers' organizations whose object was the curing of the evils that have been mentioned and the improvement of the social conditions of farm life. Most prominent among these organizations was the Patrons of Husbandry, or the Grange. This society was begun in 1867 by a group of government clerks in Washington, D. C., under the leadership of O. H. Kelley. A few local lodges were established in the West, and in 1869 the first State Grange

came into existence, in Minnesota. The following year saw similar organizations founded in Illinois, Indiana, Ohio, and New York. Two later years there were State Granges in twenty-five states.

The original object of the Patrons of Husbandry was the improvement of farm life, not only by the removal of the burdens under which the farmers felt they were struggling, but in other ways as well. They hoped to bring about better feeling between the farmers of North and South, after the hatred of Civil War times. It seemed that farmers and their families had little but the dull routine of their work to occupy their time. There was little to stimulate their minds or to bring variety and pleasure into their daily tasks. Consequently, the Grange (and other farmers' organizations also) undertook educational work. Lecturers were sent out to discuss not only agricultural problems but also other great questions of the day. In some places local lodges and farmers' clubs continued the debates, and pamphlets were distributed for study. The study of agriculture was encouraged, and prizes were offered for good products. Agricultural newspapers increased in number and in circulation.

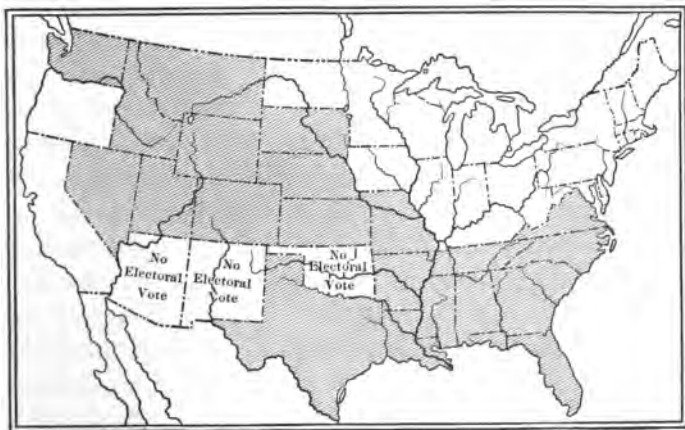
In many places farmers tried to better themselves by working together in buying supplies and in selling their products. This is called coöperation. Societies formed for the purpose bought goods, such as machinery, bagging, and twine, in large quantities from the manufacturers at low prices. Such organizations also sold and shipped produce direct to the commission merchants of the large cities, and received higher prices than if they had dealt with the local "middleman." In many cases these coöperative societies were unsuccessful because they were badly managed.

The grievances of the Western farmers were expressed in some states when Grange candidates were elected as governors and members of legislatures. The latter passed laws providing for railroad commissions — bodies of men who fixed railroad rates. These laws were too extreme in most cases and had to be repealed. But the entire movement called the attention of the country to the fact that railroads might, and sometimes did, oppress their patrons; and that therefore they should be under public control. To this was due in part the passage by Congress of the Interstate Commerce Act of 1887. Since then national laws have controlled the railroad companies more and more strictly in the matter of freight rates and proper accommodations for the public.

The fall of prices that has been mentioned continued through the eighties, and by 1890 there was a great deal of discontent in the West and South. Farmers who had borrowed money when prices were higher were now compelled to work longer and to pay back more products than this money would buy at the time they borrowed it. There arose a number of political organizations that began to put up men as candidates for office who were pledged to remove these grievances. Most prominent was the Farmers' Alliance. It demanded that the government should own warehouses where grain could be stored until prices were good; and that the government should lend money to farmers without interest.

In 1890 a great convention of delegates from all the national agricultural societies was held in Florida, and the next year a similar convention met at Cincinnati; here was founded the People's Party. In the presidential election of 1892 this party cast more than one million

votes. Four years later the Populists, as they were called, were strong enough in the Democratic party to control its convention at Chicago, and to bring about the nomination of William Jennings Bryan as the Democratic candidate for President. At this convention it was decided that if this party came into power it would enact a law providing for the coinage, at the ratio of 16 to 1, of



ELECTION OF 1896

The shaded states were carried by Mr. Bryan, showing, in general, the region of agricultural discontent.

all silver that might be brought to the mints. This was known as the "free coinage of silver" policy. This policy, it was said, would cause an increase of money in the country. Prices would become higher, the farmers would be more prosperous, and the debtors could pay their debts with the same amount of labor and farm products that the money they had borrowed years before would buy at that time. This, it was claimed, would but give justice to the farmers, who were borrowers as a

class. However, the election of 1896 was decided in favor of the Republicans, and the free coinage policy was not followed. The greater part of the voters felt that, whatever might be the justice of the farmers' claim, the policy would bring business disaster to other classes and so do more harm than good.

Just at this time other events occurred that gave relief to the farmers, and there began a new era of prosperity. One event was the discovery of gold in the Klondike region. This, with the great production of gold in South Africa, so increased the amount of gold money in the world that prices began to rise. Then, too, it seemed that just at this time the demand for farm products caught up with the supply. In the East manufacturing had been increasing very rapidly, and many thousands of persons were being drawn from the country to work in the factories. Now, too, immigration from Europe became larger than before; a great many of the immigrants stayed in the Eastern cities and so furnished a larger market for Western food products. Since 1896, then, the former trouble of too abundant farm products and too low prices for the farmer has been turned into a new trouble of not enough farm products and of high prices for the city dwellers. But this means "good times" for the farmers.

CHAPTER XX

THE RANGE AND THE RANCH

THE first region where cattle-raising was the principal industry was east of the Alleghanies in the back country and Piedmont district. Here, in colonial times, the half-wild cattle were herded by cowboys, who later fought the British in the Revolution. These were the "rough riders" of Marion's band and the other light cavalry companies that were organized on the frontier. They dashed upon the enemy, cut off his supply trains, and thus kept Cornwallis from conquering the interior of the Carolinas. From this region droves of cattle were taken as far north as the markets of Baltimore and Philadelphia.

When farmers settled upon these grazing lands, the herds were taken farther west, across the mountains. In Kentucky and Tennessee the cattle multiplied rapidly. They were driven to the Virginia valleys, where they were fattened for the Eastern markets. Later, Cincinnati came to be the greatest packing city in the country.

In the meantime another "cattle country" had become stocked with thousands of wild horses and cattle. This was Texas, where roamed the descendants of the animals first brought to America by the Spanish and French settlers. The cattle were lean and sinewy, with small bones and immense horns. The horses were the small, shaggy, and hardy "broncos."

On the broad plains of Texas these herds and droves grazed at will upon government land. This was the

"range." The cattle were "rounded up" by the cowboys; the calves were branded; and the steers were driven to the market at New Orleans. From there, before the Civil War, salt beef was shipped to the West Indies, and hides, tallow, and leather were sent to the



CATTLE ON A TEXAS RANCH

Eastern cities. As the eastern part of Texas became settled, portions of the range were fenced, and thus ranches were formed. When the railroads were extended into Texas there began a great rush to its grazing grounds. Many more than ever before tried to get rich quickly by buying cattle, grazing them on the ranches, and sending them by rail to market. The result was that the ranches were overstocked and the original fine growth of grass was grazed out and trampled down. Many of these

cattle speculators were without experience and failed to provide for winter feeding, so their enterprises failed.

At this time began the shipment of cattle farther north for slaughter at the stockyards in Kansas City, St. Louis, Omaha, and Chicago.

[In the year 1864 a discovery was made that greatly affected this branch of agriculture. The prairies of the North Central states were not well adapted for raising wild cattle, so the droves there never became numerous. The reason for this is the fact that the prairie grass, while abundant and nutritious in the spring and early summer, dried up in August and, in time of drought especially, would not support the animals in large numbers. The range and ranch cattle were not fed in winter and hence must subsist upon the dead grass under the snow. This was not possible in the central Mississippi Valley. The story is told that in 1864 a trader was driving his wagon, hauled by oxen, into the foothills of the Rocky Mountains. He was overtaken by a fearful blizzard and made a camp for himself where he might remain for the winter. He turned his oxen loose, expecting them to perish, as would have been the case a few hundred miles farther east. To his surprise, when spring came, the animals were found to be in better condition than in the fall. Their owner thus discovered that the dried bunch grass of the Western plains is very nutritious. When this was covered with snow the cattle ate sage brush.

This fact led to the extension of the Texas range farther north. Texas became the breeding ground from which droves of cattle were taken northward to feed upon the government lands that bordered the mountains on the

East. This region stretched from Texas to Montana — a strip 200 miles wide. The drive from Texas to Montana took from four to six months, the average rate being fifteen miles a day. The drove was in charge of a captain and several cowboys, who had their wagons and cook, and from forty to sixty ponies. By the year 1880 the range was supporting 7,000,000 head of cattle.

The business of cattle herding was the most picturesque that agricultural industry affords. Here we find the typical Western cowboy, whose peculiar costume was borrowed in part from that of the Mexican herdsman, but whose spirit was that of the free frontiersman of all our history. He was fond of Mexican decorations upon bridle, spurs, and bit. He wore the leather breeches (*chaparajos*), often covered on the front with wool, the broad *sombrero*, and the high-heeled boots. After weeks or months of lonely life on the plains, the cowboy was apt to lose his self-restraint in the frontier town. Then he gambled and drank heavily; sometimes in his evil moments he "shot up the town," with more noise than damage. But not infrequently some fellow cowboy or the gambler who had wronged him felt the force of his bullets.

Before the fencing off of the ranches, the range was free and open to any person who could buy cattle and hire cowboys to guard them. A group of these "cattle punchers," as they were called, built a log cabin and stayed on the range during the winter, while the cattle roamed at large. Of course, the herds of different owners became mixed, so there was a spring round-up for branding the calves. Each owner sent one or more cowboys to each of the places decided upon for a round-up, in order that his cattle might be protected. A camp outfit

stocked with provisions was taken to the site of the round-up. From here every morning the men set out on their horses, riding many miles, and driving in the cattle to this central point from all directions. In the afternoon the cowboys rode into the herd thus collected, each "cutting out" the cows with calves that belonged



HERDING CATTLE ON THE WESTERN PLAIN

to his employer. When a group had thus been separated from the larger herd, the calves were roped with a lasso, and were thrown and then branded with hot irons. If this was done on the open plain it required much skill. It was easier work when a corral was built, within which the branding could take place.

But at best the work was extremely hard, as the wild cattle would frequently break away and would sometimes get into dangerous places from which they had to be rescued. Each man used two or three horses a day, and had ten or more at his command, in order that they might get sufficient rest. But there was little rest for the men during the two or three months that the round-up

lasted. Besides being in the saddle from daybreak until dark, they took turns in standing guard around the herd at night. As the round-up districts averaged some 2000 square miles, one can easily understand that a great amount of riding was necessary.

This work was not only difficult, but dangerous as well; for the broncos were often as wild as the cattle, and their "bucking," while it furnished amusement for the spectators, sometimes resulted seriously to the rider. Besides, it was necessary to ride the horses at full speed over all kinds of ground and through streams where holes and quicksands were common.

The most trying and dangerous part of the occupation came when a stampede, caused perhaps by a thunderstorm, started the cattle upon a wild run. Whether it was day or night, the cowboys had to follow, and, if possible, head off the leaders. It was necessary afterward to search for many miles to find the scattered animals. Such a stampede might occur on the long, weary "drive" from Texas northward, or when the cattle were being taken from the range to fattening grounds in Kansas, Nebraska, or farther east. At these points the cattle were loaded upon trains and then began another tiresome journey to Omaha or Chicago. At regular periods the cattle were unloaded and allowed to rest. But finally the great steers were safely penned in the stockyards, ready for slaughter.

On the great cattle ranges another source of danger was the presence of Indians. Considerable parts of the Western plains had been set apart by the government as Indian reservations; but the Indians were not closely confined to them. The cowboys were not always just

in their treatment of the Indians, and the latter, when off their reservations, revenged their wrongs upon any cattle or cowboys that they met. After the defeat of Custer in 1876, the Indians were pursued and confined to their reservations.

The extension of railroads into the Far West helped to make stock raising a more profitable business. In 1878, cattle on the range were worth \$8 a head; a few years later they were worth \$12, and soon they rose to more than \$20. Meanwhile, the quality of the stock had been much improved. Shorthorns and Herefords had been brought to the West and soon, instead of the lean, nervous Texan steer that was afraid of a man who was not on horseback, we find the more solid beef cattle of to-day. At the same time the breed of mustang ponies had been mixed with better blood, and a larger, stronger horse was developed.

This "boom" in the cattle business pushed it beyond the first ranges of the Rocky Mountains, into the valleys and along the ranges of Wyoming, Montana, and Idaho, and even to the states of the coast. It also gave rise to the "cattle kings" of this region — men who got immense wealth from the business. Before the government interfered with the free use of its land by stockmen, a cattle owner who was becoming crowded by neighboring herds would fence a tract miles in extent bordering on a stream.¹ Watering places, it may be said, are not too

¹ Fencing on a large scale, especially in a country where trees are scarce, was made possible by the use of barbed wire, for the invention of which Mr. J. F. Glidden of Illinois has the credit. Wherever the clearing of forests made rails and lumber scarce, barbed wire became the cheapest fence material. Thus the stock and dairy interests have both been greatly favored by this important invention.

frequent in that dry country. Often it was merely a spring or a "water hole" of which he took possession, but the range for many miles around was thereby made useless to any other cattle owner. Many were the fierce conflicts for the possession of these choice spots. When the government extended its surveys over the Far West, and ousted the cattleman who had thus taken land illegally, various other methods were used by him to obtain good grazing tracts. He sometimes had each of his cowboys take a tract of 160 acres under the Homestead Law. Or, he would file claims of that amount each for a number of "dummy" homesteaders. Then all of these claims would be transferred to his hands.

Another method was this: in 1877 Congress passed the Desert Land Act, providing for a grant of 640 acres to any citizen, with the idea that he would make arrangements for irrigating it. It is said that this law was merely a device of cattlemen to get larger tracts of good grazing land. Stockmen also took advantage of the Swamp Act, under which grants of liberal tracts of land were made on condition of its drainage. The claimant in this case was made to swear that the tract desired was so covered with water that he had rowed over it in a boat; placing a boat in a wagon and driving it across the tract enabled some who were without conscience to say that they "*rode* over it in a boat." By these and other devices, ranches that included thousands of acres were acquired. One cattle company had 600,000 acres, over 900 square miles, a tract three-fourths the size of Rhode Island.

The illegal grazer also came into conflict with the settlers who poured into the mountain states when the

railroads penetrated there. Sometimes the frontier farmer would be driven off, or even killed by reckless cattlemen, who considered that they had first right to the land. On the other hand, the cattlemen were often provoked to violence by the stealing of their stock, called



SHEEP RANCH

“cattle rustling.” Horse and cattle thieves have always been considered the worst of criminals on the frontier, so hanging was their fate when they were caught. “Neck-tie parties” was the rough Western name for the lynchings that took place.

Along with the cattle business, sheep raising grew to large proportions in the Rocky Mountain States. In the summer time the mountain sides, and in the winter the valleys, furnished grazing grounds for the flocks.

The work of caring for flocks containing thousands of sheep involved much hardship. The men and horses had to be on duty in the heat and dust of torrid summer days, and had to fight for their lives and for the preservation of their flocks during the terrible blizzards of winter. They were always assisted by their faithful and intelligent shepherd dogs; these knew just how and where to guide the straying sheep.

As the flocks of sheep grew more numerous, their owners came into conflicts with the cattlemen; for the sheep cropped the grass so short that there was none left for the cattle. These conflicts often became fierce and bloody. The cowboys, always armed, and always ready to show their courage in defense of their herds, fought many battles. This condition lasted for some years, but has now almost disappeared. Then there were sheep diseases with which to contend. In recent years these have been checked by the use of dipping vats, through which the sheep are made to pass in order to be cleansed.

When sheep-herding spread into the mountain States and the cattle business was very profitable, the natural result followed: there were too many cattle for the amount of grass. This led to the destruction of the grazing lands and therefore to a decrease in the number of cattle raised on the Western ranches. Then, too, the settlement of the country by farmers has reduced the amount of pasturage. The United States government has made vast tracts in the mountains into forest reserves; but in the reserves the government allows under contract the grazing of millions of cattle, horses, and sheep. At the same time the rapidly growing city population in the East has increased the demand for meats. As a

result, we have seen rising prices of beef on the hoof and consequently of steaks at the local markets.

The business of feeding ranch cattle, and thus fattening them for the market, has become very great in the corn-growing states. But the business of packing meats has largely fallen into the hands of a few great packing houses. Their control of prices discourages the small farmer who tries to raise cattle for slaughter. Some of the packers have been convicted by the United States government for combining to control the entire business to their own advantage.

All these changes in the conditions that existed thirty or more years ago have resulted in the disappearance of the old, adventurous range and ranch life. In the course of our history, the business of grazing has moved across the country, always keeping somewhat in advance of pioneer farming, from the foothills of the Alleghanies to the plateaus and valleys of the Rocky Mountain system. In one region after another, it has given way before the advance of the farmer, who could make better use of the land. Thus, by the force of circumstances, the business of stock-raising has become less haphazard and speculative, and more scientific. With this change, and with the narrowing of the limits within which it can extend, it has become less picturesque, but more stable and, on the whole, more profitable.

CHAPTER XXI

THE AGE OF MACHINERY

BETWEEN the years 1825 and 1850 there came into use the iron plow, the threshing machine, and the mower and reaper, whose advent marked three great steps forward in the direction of modern farming. In the years that followed, hundreds of inventors were at work, and thousands of patents were granted for new implements and for improvements upon those already in use. Indeed, this machinery has made greater changes in methods of farming than all the changes that had come about in the whole previous history of agriculture.

In order to account for this great revolution, it must be remembered that this is the age of machinery in all industries. The growth of factories and the use of steam in transportation began somewhat before the general use of machinery in agriculture. But doubtless the latter came partly because the application of steam to machinery in other industries was such a great success. There are, in addition, special reasons why men were encouraged to invent new machines for farm work, and these will be noticed as the various inventions are discussed.

The improvements upon the reaper, which changed it into the modern self-binder, have been described in the chapter upon "The Westward March of Wheat." This machine was further improved by the addition of a

bundle carrier, which drops a number of sheaves at the place where they are to be shocked. The use of the header in California has also been mentioned (see p. 183). This idea had been worked upon by some of the earliest inventors in European countries. It is practical only



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HARVESTER DRAWN BY THIRTY-THREE HORSES

where the climate is so dry during the harvest season that the heads dry on the stalk. A wagon with a very large box was driven by the side of the header, and into this the heads were thrown from an endless apron. On the large grain farms we now frequently find that a complete harvesting outfit consists of a combined header and thresher. Indeed, the grain is not only cut and threshed, but also cleaned, sacked, and weighed without

the touch of human hands. Such is the work of this machine as, drawn by a score or more of horses, or by a powerful tractor, it makes its way around the immense grain fields. What would the farmer of two generations ago have thought if he had been told that this might come about?

The improvement of plows and cultivators went along side by side with that of grain-harvesting machinery. The reasons for this are that land in the West might be had almost for the asking; that much of this land was open, level prairie, easy to cultivate; and that, during the Civil War especially, farm laborers were scarce. Moreover, when railroads and factories were growing so rapidly and drawing men to the cities, it was quite necessary that machinery should be used on the farms to help supply the increasing demand for food in the cities. The interest in new machinery was kept alive by the practice of having "tests," in which the machines made by different manufacturers were compared. These tests were generally held in connection with county fairs, and often proved to be exciting, as well as instructive, for the on-lookers.

Yet it may be said that reapers and other farm machines came into use slowly. One reason for this was the fact that they were complicated; consequently, it was difficult to keep them in good running order. Besides, farmers were not accustomed to handling machinery of any kind. It was necessary, when a machine was sold, for the dealer to send his agent to the farm to set it up and to teach the farmer how to use it. This, of course, added to the expense. In our own day farmers are becoming machinists to no small degree, and the expres-

sion "every farm is a factory" is becoming true in this as in other respects.

The idea of a cultivator or "horse hoe" had been worked out by Jethro Tull, in England, more than a hundred years before this time. When Washington was a baby a year old (1733), Tull published a book which he called *Horse Hoeing Husbandry*. But the first practical straddle-row cultivator drawn by two horses that came into use in this country was that patented by George Esterley in 1856.

Many patents for sulky plows were granted early, but these were not in practical use much before the end of the Civil War. The three-wheeled sulky plow, one wheel of which is set at an angle, did not come into general use until twenty years later. Meanwhile, inventors had been at work upon gang plows and disk plows, and were making them a success.

One must realize that, with regard to any of these inventions, it is not possible to point out the particular men to whom credit is due for the completed machine. Often scores or hundreds of patents were taken out upon a single machine; a few of these would prove to be practical. Ideas were borrowed and developed. Consequently, each machine went through a gradual growth, and in its final form was the result of study and experiment by many faithful workers and enterprising manufacturers.

In the history of harrows, one can find that many improvements have been made upon the old homemade frame, set with wooden teeth, or with iron spikes made by the village blacksmith. An advantage was gained when the teeth were given a backward slant, for the

clods were then better crushed and the ground was smoothed. A great improvement was made when the frame was constructed of iron or steel, and especially when, after 1870, the teeth might be set by a lever at any pitch. Many years before this the disk harrow had been patented, but it did not come into general use until after that date. At the same time the spring-tooth

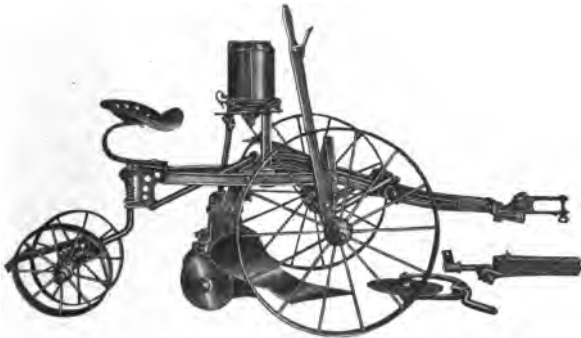


TWO-ROW CULTIVATOR

harrow was being manufactured. Gradually, there were invented sulky harrows of many kinds, suited to different soils. These crushed, turned, and smoothed the ground all in one operation. There is also a ball-bearing disk harrow with dirt-proof oil chambers.

The improvement of cultivators and harrows was stimulated by the invention and use of grain drills and corn planters; for these greatly increased the number of acres that a farmer could plant. The manufacture of seeders and grain drills began as early as 1840, but corn planters were not successful until ten years later. Improvements came gradually, until the present almost perfect machines were developed: seeders that both

plant and cover the grain, either in straight or zigzag rows, spreading fertilizer at the same time; corn planters that drop kernels of uniform size at any interval desired, or plant alternate rows of corn and beans, marking the next row at the same time. The advantage of the check-rower was early recognized, and such machines were invented before the Civil War.



A LIGHT DRAFT LISTER

About 1880 the lister was introduced. This is especially useful in dry soils, plowing and at the same time planting the seed deep in the furrow. We now have a two-row lister. In the South a double moldboard plow, called a "middle buster," has come into use for plowing the hilled-up cotton rows.

When the reaper was first invented, it was intended for cutting grass, as well as grain; there was no distinction between reaper and mower. Gradually, two different types of machines were developed, so by 1854 there was a clear distinction between them. The ease with which grass could be cut with the mower naturally led inventors to seek better ways of taking care of the hay

crop. As the mower took the place of the scythe, other machines were needed to take the place of the rake and pitchfork. The Civil War hastened inventions along these lines in the North, because of the great demand for hay with which to feed the many thousands of horses and mules used in the cavalry and transportation services of the army. The revolving horse-rake had come into use before the War; but a much greater improvement was the spring-tooth sulky rake. With this, a boy and a horse could do the work of many men.

But the hay had still to be cocked and stacked by hand. The side-delivery rake and the hay loader and hay stacker have completed the application of machinery to this branch of farm work. Meanwhile, the hay fork and carrier have come into use and another hard and

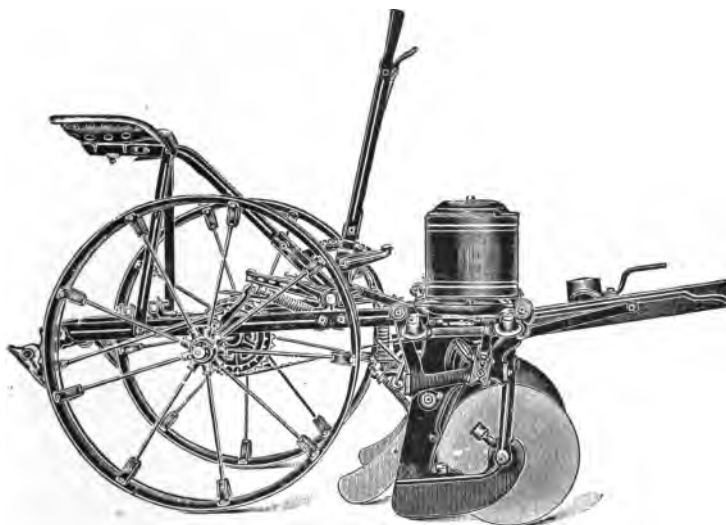


HAY LOADER

disagreeable task is being accomplished quickly and easily. The work that formerly took many hours of back-breaking labor can now be done in as many minutes and with no muscular effort except that of driving horses.

The hay tedder not only saves the labor formerly undertaken with a pitchfork, but it results in great economy as well. Grass that has become wet on the ground, or that has been trampled by horses, can be cured the day it is cut. Thus the quality of the

hay is improved and it is more profitable than formerly in moist regions. Improvements in hay balers, operated by horse, steam, or gasoline power have aided greatly in making the hay crop of the country one of the most valuable that is produced.



CORN PLANTER WITH DISK FURROW OPENERS

We have seen that improved machinery made more rapid the westward spread of wheat raising, and that the cheap wheat from the grain fields of the Far West compelled the farmers of the Middle West to turn to other crops and to mixed farming. The latter found their greatest profit in the growing of corn as feed for live-stock.

This change, in turn, hastened the invention of machinery with which to handle the immense corn crops. The corn planter and the cultivator had already come

into use, but the stalks were still cut with the corn knife, or were left standing in the field. The ears were husked by the aid of the husking peg and were broken off and thrown into a wagon that was driven slowly through the field. This work, generally undertaken after frost had come, brought cracked joints that were painfully sore to the hands of generations of farm boys. Often a canvas or leather "stall" was worn to protect the hand between the thumb and index finger.

[The earliest of the corn machines to be invented was the sheller. In about the year 1850, the old method of scraping the ear over the edge of a shovel began to be superseded by this machine. One after another there were added such improvements as the device for separating cobs and kernels,] the blast purifier, and the automatic feed. By the old hand method, a bushel or two a day was the usual product; now it is possible to shell several hundred bushels in a day.

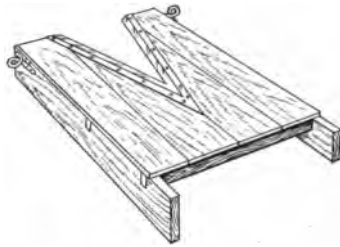
In the decade between 1880 and 1890 there were several years in which the hay crop was a partial failure; this was the time, also, when dairying was a rapidly growing industry. These two facts gave added importance to the corn crop and hastened the invention of corn harvesting machinery. The idea of a corn harvester had been worked upon for many years. In the early fifties there might have been seen, in Illinois, a poor old man, a homeless wanderer, known as "Father Quincy." He had spent his life trying to invent a machine that would cut and bind cornstalks. He was regarded as a "crank," but recent times have shown that his idea could be realized, though not until after hundreds of thousands of dollars had been spent by the manufacturers of farm

machinery, in making and testing several different types of machines.

One of the early forms of corn cutters (about 1886) was a sled that had large knives projecting at a slanting angle, sometimes in the middle of the sled, and sometimes on both sides. This cut the stalks as it was drawn between the rows. Not until ten years later did the corn



TWO-ROW SLED CORN
HARVESTER



ONE-ROW SLED CORN
HARVESTER

harvester become a practical success. Still more recently the corn binder and shocker have been brought to perfection. While the old-fashioned corn knife enabled a man to cut, with the hardest labor, one or two acres a day, the new machines now cut and bind from six to ten acres a day, the man merely sitting still and driving the machine. It does in fact seem that, as some one has said, farming is about to become a sedentary occupation!

Husking machines, upon which inventors worked for forty years, have been brought into practical use; and we also have the combined husker and shredder.

Under the old system, corn stalks were frequently left standing in the field, and the cattle were turned in to feed upon them. The stalks soon became dry and

lost much of their food value. Now, they can be cut green, with the juices still in the stalk, and can be stored away in the silo for winter feeding. The early frost that checks the ripening of the ears no longer has such terrors for the stock farmer, for his crop will still make good feed. Thus, it is estimated, a billion dollars yearly are saved to the farmers of the country, and the great dairy and stock industries are made profitable.

These important inventions, so closely connected with the industries last mentioned, have helped to maintain the fertility of the "corn belt" through the increased use of manure. The manure spreader has encouraged the greater use of this fertilizer, and has made its use much more effective than formerly, when it was spread by hand. Moreover, the farmer, his "hired man," and the grown-up boys are rejoicing that many weary hours of the most disagreeable drudgery, which seemed to bring little result except sore muscles and discouragement, have been made unnecessary.

The growth of the stock and dairying industries brought with it also the development of the windmill as a part of the farm's equipment. Everyone is familiar with pictures of the curious old windmills of Holland and other European countries—the pyramid-like houses from which projected the great arms carrying the "sails." Such were the first windmills brought to this country by the early settlers. They brought also the kind in which the turret that carried the sails rested upon a pivot and could be turned in any direction, so that the sails would catch the wind from any quarter. This was done by shifting a beam, one end of which ran from the turret to the ground, where it rested upon a wheel. These mills

either pumped water or ground grain into meal. In the latter case, the miller lived in the house under the windmill turret.

* The modern type of windmill, having a wheel instead of sails, has been developed in this country. At first, it was found difficult so to regulate the wheel that sudden or violent winds would not wreck it. The invention of the vane that turns the wheel into the wind was the work of a missionary named Wheeler, who lived in north-



STEAM TRACTION ENGINE DRAWING PLOWS, HARROWS, AND SEEDER

With this outfit 72 acres a day have been covered, in dry, hard soil, in Kansas.

ern Wisconsin, about 1866. The original form has been much improved by the use of galvanized iron, or steel, instead of wood, both for the wheel and for the frame. The wheel has also been made lighter and has been so geared that it can be driven by light winds.

A generation ago wind and animal power were the only aids the farmer had in doing the heavy work of the farm; and the latter is still the greatest source from which he gets help. But gradually steam and other

means of producing power have been brought into use, and we may venture to predict that the future holds in store some great changes in this respect. Steam was first applied to the drawing of plows on the level prairie farms. The early steam tractor was very heavy and expensive and could be used with economy only on large farms. It may now be seen drawing tandem a complete outfit of plows, harrows, and seeders; so that with every trip across the field a belt twenty-four feet wide is prepared and planted. Twenty or more acres a day are thus covered. This is an important consideration, for in some of the prairie lands it is desirable to plant as soon as possible after plowing. With a headlight on the tractor, the farmer is prepared to run his outfit day and night. Thus the use of the tractor adds greatly to the value of the crop.

[The steam engine was early applied to the work of threshing (about 1860), where it gradually took the place of the treadmill and the sweep horse-power.] With its recent improvements, the steam tractor now draws the thresher from farm to farm. The thresher is equipped with an automatic band-cutter and self-feeder, much to the relief of the crew operating the machine. And the farmer's son, in his turn, is much relieved to find that the dusty, monotonous task of stacking the straw has been taken from his aching shoulders by the swinging "wind stacker." This thresher not only cleans but also, on many farms, weighs and sacks the grain, making it ready for market.

When the year's crop has been hauled to the railway station it is no longer necessary, in many places, to lift and carry heavy sacks, or to shovel the grain from the

wagon box into high bins; for when the wagon has been drawn upon the scales it is emptied by an automatic dump, and a carrier takes the load just where it is wanted.

Within the last twenty years there has been brought into use another source of power that is making its way into farm life and is destined to have great influence. This is the gasoline engine. It has been set to work turning the milk separator, the churn, the silage cutter, the washing machine, the sausage grinder and stuffer, the feed and fanning mills, and the grindstone. It pumps water for the stock, for the house water tank, and for irrigation; it saws wood, shells corn, digs post holes, and drills the well. It mows the lawn, and runs the milking machine, the vacuum cleaner, and the lathe in the work-shop. By its power the barn and orchards are sprayed with disinfectant, and the sheep are sheared. Granaries and silos may be built to any desired height and filled by means of elevators run by gasoline. Is there any limit to which this engine may not go in relieving the farmer, his wife, and their helpers from wearying muscular effort and drudgery?

Besides the stationary gasoline engine and the kind mounted upon a truck, we now have gasoline tractors, which not only draw loads but perform other tasks when not in use as tractors. The first gasoline tractors, made more than twenty years ago, were not very successful. But within the last ten years, with improvements in the manufacture of both the gasoline and the engine, the farm tractor driven by this power is proving to be both reasonable in price and practical. It has certain advantages over the steam tractor: it is lighter and can be applied to more uses. The gasoline tractor requires no

time in which to "get up steam." It is not necessary to employ a skilled engineer to run it — any boy can do that without danger, and will take delight in his mastery of it.

The gasoline tractor on the farm, then, not only plows, harrows, and plants the fields, doing the work of ten men and as many horses in a given time; but, in addition, it reaps and threshes the crops and hauls them to town.



LARGE GASOLINE TRACTOR — CATERPILLAR TYPE

For the tractor may also be used as a truck; and it may have several boxes, so that while one is being loaded another is taking the trip to the railway station, and still another is at the station being unloaded. One can scarcely estimate the saving in time that this involves. The farmer, as well as the city dweller, is beginning to realize that "time is money."

Think, too, of the saving that results when the engine

does the work of the horse. The latter is not only expensive to buy, but more expensive to keep; and this expense continues whether he is working or not. Besides, much care is necessary to keep him in good condition. An enormous amount of farm acreage and a corresponding amount of labor are employed each year in providing feed for the horses of the country. The use of the engine on the farm makes it possible to use much of this land and labor in raising food for the people.

What has been said about the use of the gasoline engine applies also to the electric motor, which may be used in running quite as many machines. There are several ways in which the electric current is being supplied to farms. The gasoline engine may develop it, or the farmer may have a small waterpower on his farm that can be used for this purpose. In some places, a group of farms is being supplied from a central power plant. Again, the electric current may be drawn from electric lighting and power lines that pass by the farm. There are hundreds of square miles in the vicinity of large cities where such lines are already available for supplying the current.

Not all the multitude of newly invented machines can be mentioned in a single chapter. There are clover hullers, bean separators, and, of especial importance in the South, real cotton pickers. Plant setting machines have been in practical use for about twenty years; some of these water the furrow before setting the plants. "The potato planter would make the farmer of a generation ago sit up and rub his eyes. It requires that the potato be supplied, but will do all the rest of its own initiative. It picks the potato up and looks it over — or

seems to — cuts it in halves, quarters, or any desired number of parts, separates the eyes and removes the seed ends. It plants whole potatoes or parts thereof, as desired, as near together or as far apart as the judgment of the farmer on the driving seat suggests. Having dropped the seed, it covers it, fertilizes it, tucks it in like a child put to bed, and paces the next row with mathe-



TRANSPLANTING AND WATERING TOBACCO SEEDLINGS

matical accuracy.”¹ So nearly like the work of human hands is that accomplished by our modern machinery.

Our study of the early farm showed that it was a factory as well; for in the home and small shops of the farm were made the clothing, implements, and food products that were needed. Then, with the invention of machinery and the growth of factories, these home

¹ *Scientific American Supplement*, 55: 22702.

industries one by one went from the farm to the city. This process was no sooner well under way, about a half century ago, when another began that is again making the farm a factory — but of a different sort. This has come about through the use of farm machinery.

And what shall be said of the effects of this great transformation? Some of the advantages of the various machines have been mentioned as they were described. There are still several general results to be noticed.

First, we readily think of machinery as *labor saving*. In order to realize how much lighter farm work has been made by machinery, compare the work required in riding the sulky plow, reaper, mower, or cultivator with that done when the farmer walked in the furrow, swung the scythe or cradle, and plied the hoe. Think how the grain drill, the potato digger, and the corn harvester have taken the drudgery from farm work! Suppose, for an instant, that farmers were compelled to wield the flail and winnow grain by hand!

It is not, perhaps, so easy to realize how much time is saved by the use of machinery. [For example, about 1850 the time necessary to harvest a ton of hay was twenty-one hours; in 1895 it was less than four hours; and more recent inventions have even reduced this time. By the old methods it took the labor of one man for three hours to raise a bushel of wheat; it now takes ten minutes. Corn required one hour per bushel; it now takes twenty-four minutes.

Machinery not only saves labor and time on the farm, but it also makes possible a much greater product. It would be entirely impossible to produce the enormous crops of to-day, without the aid of machinery. If they

could be raised, they could not be harvested, even if every man, woman, and child in the country should turn out to assist. At the same time there has been a decrease in the cost to the farmer of producing the crops; so he has gained a greater reward and his hired laborers receive better wages. About 1830, the average daily wage paid on farms in this country was eighty-three cents, while to-day it is nearly double that amount.

Another result of the use of farm machinery is the fact that crops raised by its aid are of better quality. The hay, corn, and small grains can be harvested quickly and with the least amount of injury and waste.

Through the use of machinery, farming is becoming a more stable occupation. When the farmer has much capital invested in his business, he is less likely to change his location or to make radical changes in his crops. This keeps the supply of products more nearly constant and has a good effect upon the business of merchants, manufacturers, and others who handle or consume them.

In the next place, the banishment of much of the drudgery from farm work, through the use of machinery, has had very beneficial effects upon the persons immediately concerned. One who is bound down to a dull routine of hard labor is apt to become dull himself. When there is little variety, and the mind finds little to interest or stimulate it in the day's work, it becomes narrow and slow in action. Perhaps this is one reason why advancement in agriculture has come so late. Farmers were engaged in an industry that, before the use of machinery, seemed to offer few chances for improvement; and so they were slow to adopt the improved methods when they came.

Now, the farmer using a machine not only does less muscular and more brain work, but he has more time in which to plan his work, and can thus better solve his difficult problems. Instead of using up all his energy in grinding toil, he has time and strength in which to set for himself definite aims towards which to work. He can keep definite records and strive to excel them. He can work out experiments and thus improve his methods.

Finally, machinery, by making farm work less disagreeable, and by requiring more intelligence, is lifting the business of farming to a higher level. The farmer is becoming more self-respecting and respected. There is consequently less temptation for the boys to leave the farm; the management of machinery is proving to be a strong attraction, inducing them to stay there.

All this means for the farmer shorter hours of work, more leisure, more interest in his home and in the social and political activities of the community. Without the new era of farm machinery, the new era of farm life that is described in a later chapter would not be possible.



LIGHT FARM TRACTOR

This machine costs \$685, and will take the place of horses on many small farms.

CHAPTER XXII

ANIMAL HUSBANDRY AND DAIRYING

It is well known that the horse did not exist in America when white men first came here. But geologists tell us that, millions of years before, a curious animal that was a real horse lived on this continent. Judging from the skeletons that have been found in the Rocky Mountains and elsewhere, this prehistoric horse was about two feet high and somewhat resembled a fox. Originally, it had five spreading toes, and evidently lived in marshy land. During long ages the climate and other conditions in America gradually changed. As the land grew harder and the grass became shorter, the horse's neck and jaws became longer. Gradually, too, its legs lengthened, so that it could run faster. It also lost its toes — excepting the middle one, upon the nail of which it finally ran. These steps in the evolution of the early horse in America can be traced from fossils. On the legs of the horse of to-day we find the splints that are the remnants of the lost toes; the hoof is merely the nail of the middle toe developed to its present size. However, this first American horse disappeared entirely, perhaps because of the coming of glaciers; and our modern horse descended from those brought over to America by the early colonists.

In colonial times the horses, like the other live-stock, were small and poor; yet they were of great consequence, because roads were poor and, where waterways were not

available, horseback riding was the most common method of travel. In the South, where settlements were separated by wide distances, horses were of more importance than elsewhere. Thoroughbreds were brought from England to Virginia, and here, as well as in the Carolinas, the planters took much pride in their riding horses. Blooded horses were taken from Virginia to Kentucky, and this state soon became famous for the best breeds. At this time, too, the Narragansett pacer was a prominent horse.

In all of our early history, the breeding of fine horses came about in connection with racing. In the decade before, and again just after the year 1800, there was great popular interest in horse racing. Often a horse from the South would run against one from a Northern State. It is said that in one race, run upon a track on Long Island, opposite New York City, a hundred thousand people were in attendance, and the purse was \$10,000. At that time a race was run in three four-mile heats. The time in this case was 7:37½, 7:49, and 8:24 for the three heats respectively.

A famous stock of horses was the Morgan breed of Vermont, the founder being Justin Morgan (about 1790). A great many descendants of this horse made high records in running, trotting, and pulling tests. But the main value of the breed lay in the fact that it furnished the farmers of the North with a sturdy work-horse of enduring quality.

Trotting races did not receive much attention in this country until after 1820. As with running, the popular idea was to see how far a horse could go at a fast rate; consequently, long heats were customary. One of the

early high records for the mile is that of the horse Yankee, which made the time 2:50 in the year 1806. This time was gradually lowered by various trotters, until, in 1867, Dexter was the champion, with a record of 2:17 $\frac{1}{4}$. After 1870, the idea of fast trotting in shorter heats became more popular, and more attention was paid to the breeding of fast horses. Consequently, there was the rapid



MORGAN HORSE

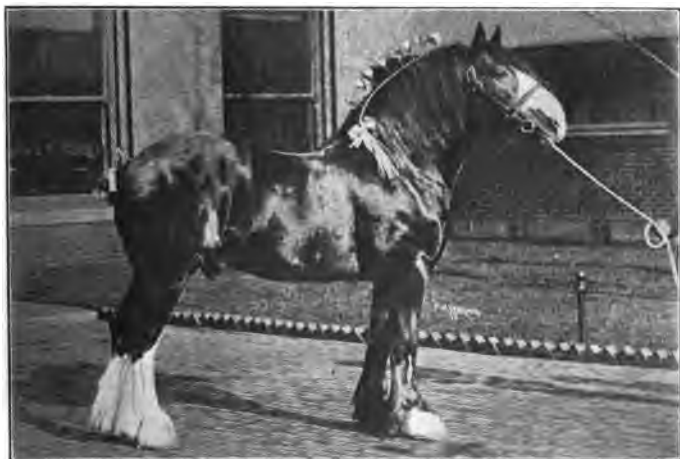
lowering of the trotting record, by Goldsmith Maid to 2:14 (1874); by Maud S. to 2:10 $\frac{1}{4}$ (1881); by Jay-Eye-See to 2:10 (1889); by Sunol to 2:08 $\frac{1}{4}$ (1891); by Nancy Hanks to 2:04 (1892); by Alix to 2:03 $\frac{3}{4}$ (1894); by the Abbot to 2:03 (1900); by Cresceus to 2:02 $\frac{1}{4}$ (1901); by Lou Dillon to 1:58 $\frac{1}{2}$ (1903); and by Uhlan to 1:54 $\frac{1}{2}$ (1913).

There had early been trotting clubs, but after 1870 these became more numerous, and their activities had more influence. It is natural that this interest in fast horses should have the effect of improving the grade of horses in

common use; and in this way the breeding of racers has had a beneficial effect upon our animal industry.

The breeding of draft horses did not begin early. Percherons first became important about the middle of the last century, and the Clydesdales somewhat later.

The story of how the first fine sheep came to America was told in detail in a former chapter (see p. 98). After



CLYDESDALE DRAFT HORSE

the European wars were over (1815), the importation of new breeds was very gradual. Some Cotswolds were brought to this country in the thirties and forties; South-downs and Oxford Downs still later; and afterwards Shropshires were introduced. The breeding of fine sheep and hogs was followed in certain localities before the Civil War. But after the year 1870 this work was given a great impetus through the formation of breeders' associations.

Very few high grade cattle were to be found in the American colonies. The Dutch brought Holsteins to New Netherland, but the animals became mixed with poorer stock. Before 1800, Shorthorns were brought into Virginia, Maryland, and New York, and between 1830 and 1840 there was an importing company in Ohio. About this time, Guernseys were brought to New Hampshire. Some Herefords were to be found in this country before the Civil War, but they first attracted attention



GUERNSEY COW

at the Centennial Exposition of 1876. Meanwhile, [beginning about 1850, stockmen had begun the importation of Jerseys.]

Breeders' associations of these, as of other farm animals, became especially active after 1870. One reason for this may be found in the fact that the process of refrigeration, and the use of refrigerator cars and steamboats, came into use about that time. The slaughter of animals at the great packing centers, especially Chicago, increased very rapidly. Fresh meats were shipped by carload and boatload, not simply to all parts of this country, but abroad as well.

Another reason for the increase in better stock has

been touched upon in the chapter upon Range and Ranch; i.e. the profitableness of ranch cattle in the Far West. County fairs and cattle shows also called attention to stock improvement. Still another reason is found in the growth of the dairy industry. This became important in the East when the grain of the Middle West began to undersell the crops of the Eastern farmers. These found dairying profitable, too, as the rapidly growing manufacturing cities were calling for more and better products. Again, dairying became important in the Middle West when the wheat growers of Minnesota and the Dakotas flooded the markets with the product of their broad fields, and when Minneapolis flour invaded the grocery stores of the entire country (see p. 215).

The agricultural history of Wisconsin illustrates the change that recent times have brought to many sections of the Middle West. A generation ago the principal product of Wisconsin farms was wheat. But the wheat lands were losing their good fertility from long continued cultivation of this crop; and just at this time the competition of Minnesota and Dakota wheat began to be felt. The winter wheat flour of the local grist mills was driven out of the market by the whiter and cheaper Minneapolis flour. Between 1880 and 1890 the amount of land devoted to wheat in Wisconsin declined nearly two-thirds, while the product declined one-half. The farmers were obliged to look for other crops. They turned from wheat to corn, oats, and barley and began raising hogs and cattle, with excellent results. A systematic course of education in scientific farming was carried on by means of farmers' institutes. The dairy business was made more prominent through the efforts

of W. D. Hoard, editor of *Hoard's Dairyman*. According to the census of 1910, Wisconsin was the leading dairy state of the Union. Its butter, cheese, and condensed milk establishments numbered 2,630, as compared with

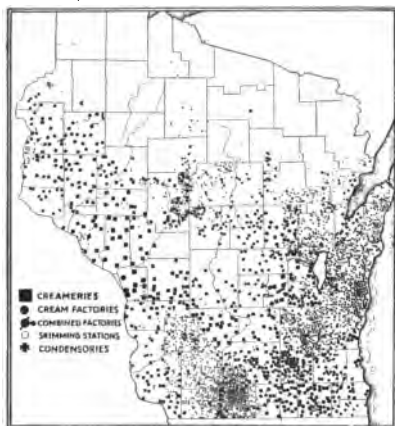
1,552 in New York, the next in rank. Wisconsin then produced about one-fifth of the country's total output of these important products.

At the present time (1915) the cheap wheat of the Canadian Northwest is having an effect upon the farming in Minnesota and the Dakotas, like that which came about in the states farther east.

Because of this competi-

tion, and for other reasons, the farmers of these States are turning more of their efforts to diversified farming, in which dairying is very important.

The history of processes in dairying is of great interest, and shows remarkable development. We may say that the use of machinery has completely changed this industry within the lifetime of our grandfathers, or, perhaps we should say, of our grandmothers. In the early times, when each family supplied little more than its own needs, many cows were allowed to "go dry" during the winter, and there was little winter butter-making. A



CREAMERIES, CHEESE FACTORIES, ETC.
IN WISCONSIN, 1910

Courtesy of Wisconsin Agricultural
Experimental Station.

cow that would make a pound of butter a day for three or four months of the year was better than the average.

Each farmer's wife made butter and cheese for home use, selling the surplus in the local market. There was no uniformity in quality, no certainty of clean and sanitary methods. The milk was "set" in pans in the farmhouse cellar or in the spring-house. When it was skimmed, a good percentage of the butter-fat was left behind and wasted. It is estimated that in this way the average cow yielded from twelve to fifty pounds of butter a year less than it might have produced. The cream was churned in the old-fashioned



BUTTER MAKING — THE OLD WAY

wooden-dasher churn that has tried the patience of many a farm boy and girl.



BUTTER MAKING — THE NEW WAY

The change from home to factory, and from hand labor to machinery, in butter-making began in this country when the first

creamery was established in Orange County, New York. This was in 1861, and creameries soon spread rapidly in that and neighboring states. A great improvement in this business came about through the adoption of an invention that was brought from Europe. This

was the cream separator. The first form, invented in Germany in 1864, consisted of pails that were swung around a central shaft. From these the cream had to be skimmed. Fifteen years later, the present form of the



MILKING MACHINE

separator was made complete in Sweden and Denmark, and was rapidly brought into use in this country.

Several advantages have come with the use of the separator. First, it secures a larger percentage of the butter-fat than the old-fashioned skimming method did.

Next, there is an advantage in securing the cream while the milk has its natural warmth. Then, too, the skim milk can be used while it is still warm and sweet. Finally, there is a great relief to the women of the farm, for the care of the milk and the cleaning of milk pans was a heavy task.

When the separator first came into use, the whole milk was taken to the creameries. Afterwards, skimming stations were established, to which the milk was brought and from which the cream was forwarded to the creameries. Now, nearly every farm home has its own separator.

Another invention of the greatest importance has placed the dairy business upon a scientific basis. Before 1890 cream was paid for at the creameries by the inch. One can readily see the unfairness of this method, for it took no account of quality. To correct this, men sought to find new ways of testing the amount of butter-fat in milk.

The first practical test came from the work of Professor Stephen M. Babcock, of the University of Wisconsin, in 1890. Mr. Babcock took out no patent on his invention: he gave it freely to the world; and so simple and effective is the little machine that it is everywhere used. The Babcock milk test has revolutionized the dairy industry, not only of this country but of foreign countries as well.

The farmer's milk and cream are now paid for according to quality rather than quantity. This has obliged him to pay attention to the quality of his stock, which in turn, has led to the breeding of the best grades of stock. The farmer now studies each individual cow, particularly as to its care and feeding, in order to get the best product. The result is that there have been bred in America Jerseys and Guernseys that show better butter-making records than those of cows raised in the islands from which these breeds originally came.

In the middle of the last century, cheese-making was no farther advanced than it had been for centuries. The work, which was difficult and required considerable care, was done by hand and in the home. At night, after the milking was done, a tub was filled half or two-thirds full of fresh, carefully strained milk. If the milk was not warm enough, a part was heated to bring the whole to the temperature of about 98° F. To this warm milk was added a certain amount of rennet, which coagulated it. Rennet is the prepared inner lining of the calf's stomach. The tub was then covered with a square of cheesecloth and left overnight. In the morning the



ORIGINAL FORM
OF BABCOCK
MILK TESTER

milk was found to be separated into two portions, the thick curd on top and the whey, resembling milky water, beneath. The next operation was to cut across the curd in both directions, thus forming squares.

A rack, or short ladder, was then placed across the top of an empty tub and on this was set the "cheese basket"



JERSEY COW

Producer of 800 pounds of butter in one year.

— a shallow, openwork basket of splints. The curds were then lifted into this basket, which had previously been lined with cheesecloth. The whey drained through into the tub below. Later, a pail or more of clean, cold water was poured over the curds in the basket. Next, the proper amount of salt was mixed into the curds with a wooden spoon or paddle. Sometimes sage was added, thus making "sage cheese," which was considered a great delicacy by some people. Color could be given to the cheese by the addition of a small amount of cooked carrot.

After the curds had been properly drained, they were placed in a "cheese hoop" — a circular wooden cylinder,

fifteen to eighteen inches in diameter and from six to eight inches deep. Circular blocks of wood were fitted into the top and bottom of the cheese hoop, which was then taken to the cheese press. Here, by a screw or lever device, pressure was applied to the upper block and increased from time to time during the next twenty-four hours. The cheese was then removed, and the ragged edges, caused by the pressure forcing the curds between the hoop and the blocks, were trimmed off. A fresh cloth was wrapped about the cheese, it was placed back in the hoop, and was returned to the press for a second twenty-four hour period. When it was next removed, a new piece of cheesecloth was firmly sewed about it and then the entire surface of the cheese was rubbed with butter.

The next process was that of curing, which took from three to six months. As each cheese was made, it was placed on a shelf in the cheese room or cheese house; and each day all were rubbed with butter and turned so that they would cure evenly. Such was the long and difficult process of domestic cheese-making.

✓The first cheese factory was built in Oneida County, New York, in 1851. Like the creameries, these factories spread rapidly throughout the East. It is estimated that in 1850 there were produced in the entire country about a hundred million pounds of cheese, all, of course, made on the farm. According to the census of 1910, the product was about 320,000,000 pounds, of which all but two or three per cent was made in factories. In the case of butter-making, however, the proportions are quite different, more than one-half the product still being homemade.

The first cheese and butter factories were organized on the associated, or coöperative plan; that is, the farmers who furnished the milk owned shares in the business. This idea has spread throughout the country, and several different plans are found in various localities. According to one plan, each farmer who is a patron (that is, furnishes milk to the creamery or cheese factory) shares in the profits according to the amount of milk, or rather butter-fat, that he brings. A manager is employed and the business is controlled by a board of directors.

In other cases a stock company is formed, composed wholly or in part of farmers, while milk is received from others who do not own shares. Under still another plan, the factory is run, as are other plants, by proprietors who buy the milk and take the profits.

[The business of making condensed milk, which began about 1860, has grown to enormous proportions.] The South, especially, affords a great market for condensed milk, partly because of the backward condition of dairying in that section.

Many valuable by-products are now made in connection with cheese factories and creameries. From whey is made sugar of milk. From skim milk albumen, which has many uses, is manufactured. The casein is also extracted, and used in the preparation of paints and glues. In solid form it makes many articles of common use — combs, brush-backs, buttons, etc.

In connection with the history of dairying, it is well to recall some facts mentioned in the previous chapter, with regard to the increased use of machinery. The

proper support of dairy herds involves the harvesting of immense crops of hay and corn; there must be no uncertainty and no failure with these crops. The machines previously described make this result possible. The use of the silo is also a most important step in the progress that has been made by dairying within the last few decades.

The dairy industry of the country has been greatly



MODERN BARN WITH SILO

helped, not only by the organization of the breeders' associations previously mentioned, but also by dairymen's associations. The American Dairymen's Association dates from 1863, and the Northwestern Dairymen's Association from 1867. Since then many State associations have been formed.

Cow-testing associations began in 1905, and now much testing is being done by students in schools. Agricultural colleges have given much attention to this

subject, and short-course dairy schools during the winter months may now be found in most of the States.

Important changes have also taken place in the business of selling milk for town and city supply. The carrying or shipment of milk for considerable distances was impossible before the refrigerating process came into use. Now, a part of the milk supply of any large city comes from a distance of two or three hundred miles. Then, too, this business has been placed under stricter governmental control. The tuberculin test, creamery and dairy inspection, and the official testing of both the richness and the cleanliness of milk have had important effects upon both the farmers' conduct of the business and the health of city dwellers.

The development of dairying during the past half century has influenced our agricultural life in ways that it is impossible to estimate. As a result of improved dairying, the farmer's wife has been relieved of much drudgery; but the farmer himself has become more closely bound than ever before to his duties in the care of stock. For, though the milking machine is used to some extent, the prompt and regular feeding and milking of the cows, the weighing, testing, and recording of the daily output on "milk charts," such as are kept by scientific farmers, the sanitary disposal of the milk, the cleaning of the utensils, and of the cows and stables as well — all these things make severe exactions upon the time and thought of the up-to-date dairyman.

The income received from the sale of dairy products is now a very important part of the American farmers' reward for their labor. But even more important is the effect of dairying in keeping up the fertility of the soil.

In one section of the country after another, the run-down soil has been restored and kept in the best condition through the dairy herd; while at the same time a rich profit is received from the products yielded by the fine animals that make this possible.

CHAPTER XXIII

THE NEW ERA OF SCIENTIFIC AGRICULTURE

ALL through American history, until the time of the present generation, the increase of farm crops came chiefly from the use of new land. It is said that the American farmer has been a miner, rather than a farmer; that is, he has extracted valuable materials from the earth without returning much to it. Only now is he putting into practice to any large extent the principle of raising better crops by better methods. The general ideas of scientific farming were held by many men as early as Washington's time and before; but there were three obstacles to their being put into practice by the average American farmer, both of those days and of much later times as well.

1. It was easier, and generally more profitable, to cultivate new land than to do intensive farming on the old.

2. Even the most intelligent farmers had little knowledge of the proper treatment of soils and plant life; the scientists themselves knew little about such matters.

3. The mass of farmers would not adopt such new ideas as came to them. To do that would be "book farming" and entirely impractical, they said. This reluctance of farmers (even those of the last generation) to accept advice from experts, or to profit by the experience of those who had made experiments in a scientific manner, may be at least partially explained. These farmers were either actually, or in spirit, pioneers.

The pioneer is by nature and necessity independent. He succeeds in a new country and in the midst of hard, adverse circumstances by being able to take care of himself, and his chief pride is his self-reliance. Says a friend of the writer, "My father and mother were pioneers, and I know that they had a sort of stubborn pride in doing things and meeting emergencies in their own way, perhaps because they had survived the test of a period when they had to rely on themselves. In that time there was no one to advise them, and each new emergency was unique. In later times, when the country was settled, they still took pride in following their own peculiar methods, when it would have been both easier and less expensive to seek the advice and experience of others. This pride was perhaps unfortunate, but I like to think that it was a pardonable relic of a quality that had enabled them to survive and had inspired them to encounter the rigors of pioneer life."

Gradually, in our own times, these obstacles are being more or less completely overcome for three reasons.

1. The supply of government free land of good quality is becoming exhausted; so it is necessary to do better farming.

2. The work of investigation carried on by colleges of agriculture and by the State and Federal departments of agriculture has given us a great mass of accurate scientific knowledge about soils, plants, and animals.

3. A new generation of farmers is arising, who have been educated in various ways to believe in the work of scientists and experimenters and who are willing to drop their old methods and to try new ones. This change that is now coming about — from the old "guess-work"

agriculture, based upon superstition, tradition, and custom, to the new scientific agriculture — is as great a change as that from hand to machine methods on the farm.

We saw in Chapter IX that soon after the American Revolution agricultural societies were formed and that papers devoted to the interests of agriculture began to be published. Then, later, agricultural fairs became numerous. All these had an educational influence. But the first direct teaching in agriculture in this country seems to have been in a school established in 1821 at Gardiner, Maine.

Soon after, the subject was taught in Connecticut and Ohio. Everywhere, both North and South, men were talking about the necessity for agricultural education; but few were willing to invest money in schools or colleges that should do the work. Some believed that the state governments should support such institutions; but the state legislatures refused to make the appropriations. Agricultural departments were attached to numerous academies and colleges, and finally, the first agricultural college in the United States was opened, in 1857, at Lansing, Michigan. Maryland, Kansas, and Pennsylvania followed in succeeding years the example set by Michigan.

But the most important step in aiding the cause of scientific agriculture in our country was the Morrill Act, named for Justin L. Morrill, representative in Congress, and afterwards senator, from Vermont. This law, passed by Congress in 1862, gave to each state, under the conditions named below, as many times 30,000 acres of public land as it had senators and representatives. The

states were to sell this land and thus accumulate funds that were to be invested. The interest from these funds was to be devoted to the support in each state of a college of "agriculture and mechanic arts." The states were to provide the buildings for these colleges. How remarkable it was that in the midst of a dreadful civil war men should turn their eyes in the direction of scientific agriculture as a means of building up the strength of the nation!



AGRICULTURAL HALL, NORTH CAROLINA COLLEGE OF AGRICULTURE

The "land grant" colleges thus provided for now exist in every state of the Union, as well as in Hawaii and Porto Rico, the total number being 68. They are in some cases connected with the state university and in others they are separate institutions. They have been a powerful means of bringing about the study of new methods and of educating young men to apply these methods in actual farm work.

The holding of farmers' institutes was begun in New England before the year 1870, and has continued from year to year extending throughout the country. Thus the scientific knowledge of the colleges has been spread

broadcast, and better methods have been preached in the ears of every farmer who was willing to listen.

In 1890 Congress passed a second "Morrill Act." It gradually added to the funds from which the state agricultural colleges are supported until the amount received yearly was \$25,000 for each. Still later, in 1907, the annual amount donated to each college was increased to \$50,000.

Now, an agricultural college ought to do more than merely teach the knowledge that men already have

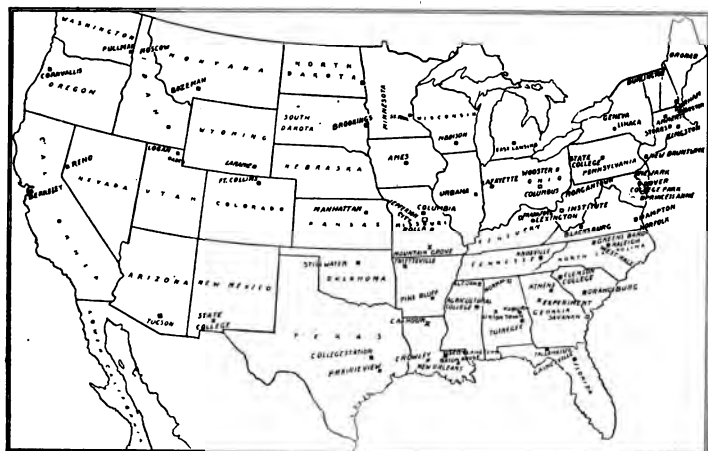


WISCONSIN AGRICULTURAL COLLEGE AND EXPERIMENT STATION

about the work of farming. It should be, in addition, a place where new knowledge is constantly being discovered. This can only come about by conducting experiments, and this our agricultural colleges have done from the very beginning. In some cases, the early agricultural societies encouraged experiments on a small scale, and such work was carried on by the Department of Agriculture when that was first established (1862). But the first separate state agricultural experiment station was that of Connecticut, in charge of Prof. W. O.

Atwater (1875). Within a few years a number of states followed this example.

The greatest step in this direction was taken in 1887, when Congress passed the Hatch Act, appropriating money for experiment stations in connection with the various agricultural colleges. These stations not only



MAP SHOWING LOCATION OF AGRICULTURAL COLLEGES AND
EXPERIMENT STATIONS

conduct investigations and make experiments in all fields of agriculture, but also publish bulletins and reports in which the results of their work are set forth. In the Department of Agriculture at Washington there is an "Office of Experiment Stations," which keeps in touch with all the stations and brings together the results of their work. There are at present sixty-five of these stations.

It is quite impossible to describe in a simple way all the different kinds of scientific work that have been

done in the colleges and experiment stations.¹ Perhaps these may be brought under different heads, as the different sciences have been employed in the gaining of new knowledge. The principal ones are botany, chemistry, bacteriology, zoölogy, and entomology.

The study of botany has been especially valuable in the work of plant breeding. It is well known that our grains, fruits, and vegetables, as we have them to-day, are better in many respects than those of a hundred years ago, when plant breeding was in its infancy. The practices of seed selection and cross fertilizing, at first carried on by guess-work methods, have come to be based upon scientific principles. A famous example of early efforts along this line is the development of the Concord grape, by selection from a native wild grape. This work was done by Ephraim Bull of Concord, Massachusetts. Beginning in 1840, without scientific knowledge, Bull patiently studied his problem; and although the fine variety of grape that he produced has given many men wealth and all of us pleasure, he himself died in poverty.

Many important varieties of pears and apples have been developed from chance seedlings that happened to attract attention. The Baldwin apple had its origin in this manner, in 1782, and a monument has been erected on the spot where the original tree stood. By careful selection, also, there were developed the Northern Spy, beginning in 1800, and the Jonathan (1829). The Wealthy apple is the result of persistent efforts made by Peter M. Gideon of Minnesota, about 1855, to find an

¹ The scientific work of the Department of Agriculture is described in the next chapter.

apple tree that would endure the great cold of the Northwest. Each year, for nine years, he planted enough seed to grow a thousand trees, but all the seedlings were killed. Finally, from one small crab tree there was developed the fine variety now so famous, named for his wife, Wealthy.

Some of our most important varieties in plums, berries, and tomatoes are the product of careful hybridization —



PRIZE CORN

the crossing of two or more varieties. Within the last fifty years, the tomato has been changed from a small, lobed fruit to its present size and shape. The Early Rose potato dates from about 1861. Many famous varieties were thus produced before the science of plant breeding came into being. But now the plant breeders work intelligently, according to nature's laws, without such waste of time and effort as formerly. They plan to bring about certain qualities in plants — a beardless barley, a cold-resisting wheat, a longer stapled cotton — and they succeed. Breeding associations in large numbers are studying, experimenting, and spreading broad-

cast the result of their work, to improve the qualities of our farm plants.

The original American Indians practiced seed selection in their growing of maize; but a wonderful change has been brought about in the size and character of this grain, by the systematic work of scientific men.

Great interest has been aroused in the subject of plant breeding through the work of Luther Burbank. Though he has been called a wizard, there is no secret about the methods by which he selects seeds and plants having the characteristics that he wishes to develop. Let Mr. Burbank tell in his own words about the beginnings of his work. It was when he was a boy in Massachusetts that he raised roasting ears and brought them to the Fitchburg market two weeks earlier than those of his neighbors. He says: "The whole secret of my plan was to germinate the corn before planting it. Before my neighbors, or I, could begin spring plowing, I obtained fresh stable manure which I mixed with leaf mould from the woods — about half and half. While this mixture was moist and hot I placed the seed corn in it, mixing the whole mass together lightly. This I allowed to stand until the seed had thrown out roots ranging from two to six, or even eight inches in length, while the tops had grown about one-half an inch.

"In the meantime, as soon as possible, the land was prepared to receive this sprouted corn by making drills about four feet apart. Along these drills this corn was dropped liberally, no attention being paid as to whether it was right side up or otherwise. I then covered it about one-half inch in depth. It was nothing unusual to find the corn up and growing next morning; and this

method alone insured me a crop at least a week in advance of all other planters who could reach the Fitchburg market.

"But this was not all. As I said before, the kernels were planted quite liberally along the drills. Some would show a very strong growth and some a very weak growth. The weaker ones were pulled out after a few days and the stronger ones left at a distance of about twelve to eighteen inches apart. Thus by selecting the strong from the weak, and giving the best fitted the best opportunity to grow, I gained a total advance of nearly two weeks over my competitors. The result was that I averaged 50 cents a dozen for my corn with an eager market, where my competitors found their product, two weeks later, a drug on the market, at ten cents or less per dozen."¹

By his skill in selected plants, Mr. Burbank has "created" valuable new varieties. It is estimated that the Burbank potato is adding seventeen and one-half million dollars annually to the farm incomes of the country. His spineless cactus is used for forage in arid regions. Remarkable walnuts, cherries, and other fruits, and a host of beautiful flowers show the possibilities of methods of selection that can be applied anywhere.

Chemistry was one of the earliest sciences to be brought to the aid of agriculture; but it was nearly 1850 before very important results came about in this country. Chemistry has given us an ever-increasing knowledge of the composition of soils and plants. When one knows what elements are present in the soil, and what are lacking, he has taken the first step toward better crops. It has been discovered that the principal elements that

¹ *The Works of Luther Burbank.*

the soil should contain in certain proportions are nitrogen, potassium, and phosphorus. If any of these is lacking in a given field, it should be supplied. The science of chemistry is interested not only in discovering the lack, but also in discovering sources of supply. With regard to the last-mentioned element — phosphorus — this country has been dependent upon the supply of phosphoric rock from Florida, Tennessee, and South Carolina. As these have become somewhat exhausted, new fields have been discovered in the Rocky Mountains. In 1908, President Roosevelt ordered that nearly five million acres of government land where this rock was plentiful should be withheld from sale. Thus a supply of phosphorus sufficient for many years was kept from being acquired and held as a monopoly by a few persons.

When the chemists discovered that there was not enough potassium in some soils, the necessary supply had to be imported from Germany. Later, scientists showed how to extract it from certain rocks; and still later they taught us to obtain it from sea kelp. This will prove to be a cheap and inexhaustible source of supply.

The furnishing of nitrogen to soils in which it was lacking — as in the use of manures — was practiced for a long time before the chemistry of the matter was understood. When the English colonists began farming, they had few animals and were glad to follow the custom of the Indians. These, having no domestic animals except the dog, used fish as a fertilizer. Because the dogs dug up the fish that were placed in the corn-hills, the town meeting of Ipswich, Massachusetts, passed a law, in

1644, requiring that "all the doggs for the space of three weeks from the publishing hereof shall have one legg tyed up. . . . If a man refuse to tye up his dogg's leg, and hee bee found scraping up fish in a corn field, the owner thereof shall pay twelve pence damage, beside whatever damage the dogg doth."

The farmers of America have never properly used the enormous supply of barn manure that has been at their command, partly because in early times, as is true to some extent to-day, it was cheaper to take fresh land than to build up the old. Another reason is this: recently it has been discovered that out of six million farmers who made reports, one-half have occupied their farms as owners or tenants for less than five years. One million of them have been in their present locations for less than one year. Is it any wonder that these farmers have not taken sufficient interest in the soil of their farms to keep it in good condition by the use of manure?

It is estimated that in the entire country each year's supply of manure is worth more than two billion dollars, and that from one-fourth to one-half of this is wasted! What becomes of it? In some places it is burned; in others it is dumped into ravines; again, into a creek or a hole in the ground; more often it is merely left in a pile without being moved at all.

At the same time, it is said that in 1910 the farmers spent about \$130,000,000 for artificial fertilizers. These contain various chemical elements and are manufactured for sale.

Much of this expense would be unnecessary if farmers used the improved methods now available for saving and handling this important by-product of the cows,

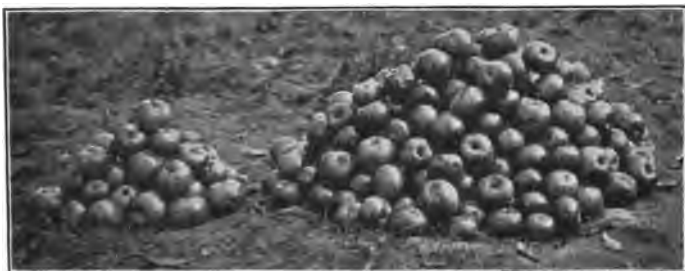
horses, pigs, sheep, and chickens. With manure carriers and manure spreaders, the labor of placing the fertilizer where it will do the most good has been much reduced; and at the same time its value in enriching the soil has been greatly increased.

The use of fertilizers is not the only way of furnishing nitrogen to the soil. It has long been known that a worn-out soil would be improved by growing upon it clover and other leguminous plants. The reason for this was discovered through another branch of science—bacteriology. This difficult science with a long name deals with the millions of minute organisms that are to be found in every cubic foot of earth, air, and water in the entire world. These tiny organisms vary in size from $\frac{1}{25,000}$ to $\frac{1}{25,000}$ of an inch in diameter. It is they who are at work when milk turns sour, or cream ripens, when cider turns to vinegar, and in all cases of decay and fermentation. Two German scientists (Hellriegel and Willfarth) discovered, in 1888, that the leguminous plants have, in nodules on their roots, bacteria that take nitrogen from the air and make it available as their food. It is through this process that the growth of these plants restores the soil. In their laboratories bacteriologists have grown the bacteria in large numbers, and have bottled them up and shipped them to farmers.



NODULES CONTAINING NITROGEN
On the roots of a leguminous plant.

The latter, in turn, by making a solution containing the bacteria, have thus been able to fertilize their lands. The next step in chemical progress will perhaps enable us, by the use of the electric current, to take nitrogen directly



Unsprayed: Poor Apples at the Right.



Sprayed: Poor Apples at the Right

RESULTS OF SPRAYING FRUIT TREES.

from the air and sell it cheaply to farmers. In fact, this is already being done in Norway.

Within the last thirty years the science of bacteriology has performed many other wonders. Through it, the nature of certain animal diseases has been discovered; for example, anthrax in cattle. Such diseases are the result of infection by bacteria. Methods of vaccina-

tion and inoculation have been discovered to combat them.

The science of bacteriology has also discovered that the fungus pests, blights, rusts, scabs, and rots on trees and fruits are due to the same general cause — minute organisms that eat away the life of the plant. Previously, these pests destroyed untold millions of dollars' worth of crops. They are now being controlled in various ways, especially by the use of sprays. We have also learned how smuts on cereals can be checked by the treatment of the seed with formaldehyde solution. Bacteriologists now stand guard at the ports of the United States to examine plants, shrubs, and trees that are imported, in order to exclude those having diseases. Plant breeders also are at work developing resistant varieties that are not easily affected by the various pests.

Bacteriology, in connection with another science, *zoölogy*, has gone far into the causes of diseases in animals. There has been organized, as a result, much valuable work in meat inspection and quarantines for

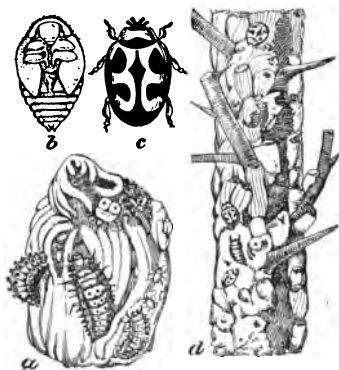


CODLING MOTH

the control of such diseases as cholera and the foot-and-mouth disease. Without the laws which scientists have helped to frame, much loss would result from the spread of epidemics, and many human lives would be sacrificed, as well, through the eating of infected meats and other products.

Entomology, which treats of insect life, is still another science that has recently made much advance. The full story of its discoveries would be of great interest. Just as the botanist studies the life history of a noxious weed in order to prevent its spread, so the entomologist

studies the lives of the insects that live in our fields and orchards, to discover how to destroy those that damage the crops. It was in this way that some forty years ago Paris green was first used to kill potato bugs. Without scientific knowledge of the codling moth, or apple worm, and its proper treatment, it would be impossible to produce the millions of bushels of apples that make our yearly crop. The life histories of the Hessian fly and the boll weevil have taught us how to control the destructive work of these pests.



AUSTRALIAN LADYBIRD

Also, on the branch, the white scale of which the ladybird is an enemy.

Entomologists have discovered insects that are enemies of various pests: a fly was brought from Spain as the enemy of the apple worm; to destroy the citrus scale a minute ladybird was found in Australia; for the black scale another ladybird was found in Africa. In some states the authorities keep on hand the insects that will kill certain pests, and they are furnished to the growers whose crops are threatened.

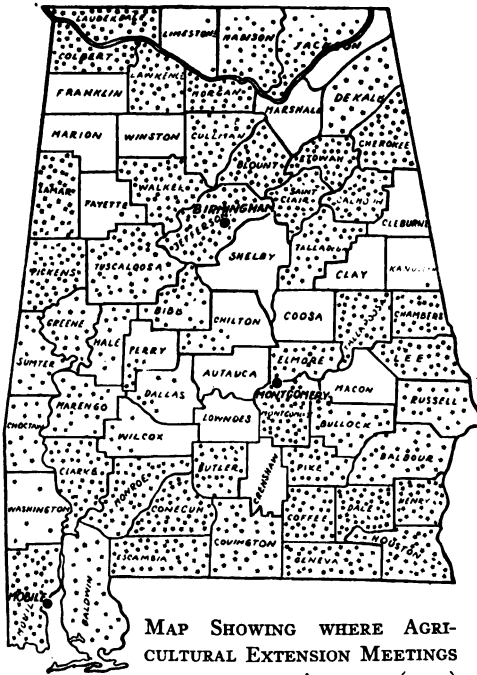
A writer has said that "the progress of agriculture in the last generation has been greater than in all the generations that have preceded. At the source of this progress has been a deeper knowledge. This knowledge has been made very largely possible through agricultural education." The centers of education have been the state colleges and the experiment stations. These have spread

among the farmers the knowledge that has been gathered, by means of their reports and bulletins; by farmers' institutes; by the winter "short courses" which farmers have attended; and by many kinds of "extension" work.

One of the first agricultural colleges to attempt extension work was that at Cornell University, Ithaca, New York. The authorities of this college began making experiments and tests on certain farms. They encouraged nature study work in the public schools, furnishing reading ma-

terial for the pupils. They also gave to farmers and their wives opportunity to read and study upon the subject of agriculture as though they were attending college. Such methods have been followed in other states.

Nowadays, the intelligent farmer who is puzzled by a farm problem, instead of consulting the almanac, with its age-old wisdom, writes a letter to the agricultural college of his state, and the rural delivery postman



MAP SHOWING WHERE AGRICULTURAL EXTENSION MEETINGS WERE HELD IN ALABAMA (1914)

brings him by return mail a reply from the expert who is spending his life studying that particular kind of problem. Or, it may be, the expert himself comes to the farm to look into the case and to work out the proper solution. In some states there is "Farmers' Week," when the farmers and their wives come to the agricultural college to see the work that is being done, to listen to lectures, and to carry home the latest ideas about the plants and animals, the machines and domestic duties that fill their lives full of hard work.

Each agricultural college, with its accompanying experiment station, is absorbed in studying a score or more of practical problems, the solution of which will help the farmers of that state. It is not possible to mention more than a very small part of the topics being investigated; one from each of several states may serve as samples of the entire field.

In Alabama, the scientists have studied the diseases and improvement of the cotton plant; in Virginia, the production of apples suited to its climate; in Maryland, experiments with stock feeding; in Florida, the pineapple industry; in Massachusetts, the improvement of farm homes; in Louisiana,



KAFFIR CORN

new varieties of sugar cane; in Connecticut, the values of different foods; in Illinois, the chemical composition of corn; in Vermont, diseases of potatoes; in Texas, the proper feeding of cattle; in Minnesota, farm manage-

ment; in New Hampshire, good roads; in Michigan, the sugar beet; in Montana, the irrigation of alkali lands; in North Dakota, the production of resistant flax; in Wisconsin, improved breeds of barley; in Delaware, the rotation of crops; in New York, the improvement of timothy; in Kansas, the introduction of Kaffir corn; in Arizona, the cultivation of the date palm. Every one of these studies results in new information; this is the beginning of progress.



MINNESOTA HIGH SCHOOL STUDENTS TESTING CORN

In several states, special trains carrying exhibits are sent out from the agricultural colleges. Illustrated lectures are held, and also consultations for the benefit of the farmers, wherever the trains stop. In some cases railroad companies, and in other instances business men's associations and implement manufacturers, have furnished the funds that support these travelling exhibits. Thus thousands of farmers who cannot go to the colleges are being brought into touch with the latest and best agricultural information.

In spite of all this educational work, directed in and from the agricultural colleges, comparatively few of the total number of farmers have been vitally affected in their daily work by all this mass of new knowledge. The agricultural education of the farmer, it has come to be believed, should begin earlier. The science of agriculture should be taught in high schools and in the grades of other public schools. The first agricultural high school was opened in Minnesota in the year 1888. Later, others were founded in several states; recently there has been a great increase in the number of high schools in which an agricultural course is offered. Various states — Virginia, Maine, and Minnesota being among the first — have given state aid to high schools that have such courses.

In several states, instruction in agriculture is required in all the rural schools. Everywhere men are saying that the best education for a child is that which fits him best to understand the life of the community in which he lives, and that enables him to take up the work of life prepared to do it well. Upon this theory, can there be any doubt that progress is being made in the right direction when the study of nature and its wonderful laws, upon which the farmer's daily work depends, forms a part of the course in rural schools? In these ways there is being reared a new generation of farmers. In earlier days they would have been laughed at as "book farmers," but they will some day be men and women who have learned that the microscope is a safer guide in agriculture than the moon, and that chemistry will show the way when all signs of the weather fail.

The problem has arisen, where shall we find the teachers prepared to teach these subjects? To fill this need, there

have been established many county training schools and teachers' training courses in high schools. The agricultural colleges also are spending a part of the money received by them from Congress in the preparation of teachers. So a beginning has been made in the work of bringing scientific knowledge to the mind of every future farmer and farmer's wife.

It has been said by an authority upon this subject that our agricultural history has passed through three stages: (1) From the beginning to about 1860 was the "self-sufficing" stage; that is, upon each farm were produced or made as much as possible of the food, clothing, etc. that the family needed. (2) From 1860 to about 1890 was the "money-making" period. The same methods of soil exhaustion were used; but the effort was to raise as much as possible of special crops for sale on the market. (3) Since 1890, we have begun the scientific age. The farmer can no longer depend upon tradition or "rule of thumb" methods. Hence the need for all the education that has been outlined above. ~

But with all our progress in many directions, there is still room for much improvement. Says a writer, "land is 'wearing out' with us in ten, twenty, or thirty years; whereas I walked over lands in Europe which had been cultivated for centuries before our forefathers first heard that an Italian named Columbus had discovered a continent beyond the seas — and these lands are producing bigger crops than then." We may add that they are producing better crops per acre than the farms of the United States. For while our average yield of wheat per acre was, in 1907, 14 bushels (having declined from nearly sixteen in 1899), that of Great Britain is

more than 32 bushels, France nearly 20 bushels, Germany 28 bushels, and Netherlands over 34 bushels. In their production of other grains and vegetables these countries show similar conditions. It may be added, however, that these results are accounted for not only by the accurate use of intensive methods, but also by the fact that the people of these countries import large quantities of fertilizers.

Such facts not only convince us of the possibilities of scientific and intensive agriculture, but they point to the necessity of it if our people are to be as well fed and as prosperous in the future as they have been in the past.

CHAPTER XXIV

THE DEPARTMENT OF AGRICULTURE

ONE who visits the city of Washington will learn much about the actual work of governing our country if he spends some time in the Capitol, where Congress meets,



JAMES WILSON

Secretary of Agriculture,
1897-1913.

and if he visits the White House, where the President lives. But he will learn more if he looks within some of the great office buildings, where the work of the administrative departments is carried on. A visit to the Department of Agriculture will vividly impress one with the extent to which this interest of the country is being cared for by the more than fourteen thousand employees of this great institution — the greatest of its kind in the world. The progress of scientific agriculture, described in a previous chapter, would hardly have been possible without the efforts of the men who have built up the Department of Agriculture from small beginnings to its present great efficiency. Only a brief account of its history and work can here be given.

From our earliest history, one government or another has fostered agriculture. King James encouraged the

breeding of silkworms in Virginia. Parliament placed a bounty on indigo to advance its culture. Most, if not all, of the colonies helped some branch of agricultural work: in Massachusetts, stock raising; in Georgia, the culture of mulberry trees; in Virginia, silk production and hop raising. We have seen that when a Board of Agriculture was established in England, President Washington recommended that Congress provide for a similar board in this country. Nothing, however, was done by



DEPARTMENT OF AGRICULTURE, WASHINGTON

the general government to encourage agriculture for many years after Washington's time.

In 1836, Henry L. Ellsworth, Commissioner of Patents, began asking the various United States consuls, who are stationed in foreign countries caring for the interests of our citizens, to send home the seeds of valuable plants that were native in those countries. These he distributed to friends. Besides doing this work, the Patent Office collected valuable information upon agricultural topics; this was printed and the reports were distributed by the government. In 1839 Congress appropriated \$1,000 for the collection and distribution of seeds.

By the year 1862 it appeared to some persons that such work was important enough to require a separate office; so the Department of Agriculture was created, and the Honorable Isaac Newton was made the first Commissioner. It was the duty of the Department to gather information upon agriculture, to publish ideas that would be of value to farmers, and to grow and distribute new varieties of seeds.

This was a small beginning, but the duties of the Department increased, until in 1889 it was placed upon an equal footing with the other departments and its head was made a cabinet officer. The first Secretary of Agriculture was Norman J. Coleman, who served less than one month. Col. Jeremiah M. Rusk, of Wisconsin, was next appointed and held the position for four years.

[Mr. Rusk was a Wisconsin farmer, who had passed his boyhood in the midst of the rough pioneer conditions of Ohio; he made an honorable record in the Civil War, and later became governor of his adopted state. He had little formal education, but was gifted with native common sense and a vigor and hearty friendliness that made him a popular leader. He at once put new life into the work of his department.

At this time the important European countries were excluding our meat products upon the ground that animal diseases prevailed here; in reality this was done principally to protect their farmers against American competition. Secretary Rusk vigorously pushed measures for stamping out pleuro-pneumonia and other diseases, and he began the work of meat inspection, which is now considered so important. Thus he forced the foreign governments to relax their restrictions, much to the

benefit of our meat producers and, incidentally, our meat consumers.]

One after another, during this and following administrations, the activities of the Department were increased, until a good description of them as they now exist would occupy an entire book. We can merely glance at a few of the most interesting. It will be understood that in its scientific work the bureaus of the Department of Agriculture act in connection with the experiment stations that are distributed over the entire country, as described in the previous chapter.

The work of the Bureau of Animal Industry, for instance, may be briefly stated under two heads: first, the improvement, and second, the protection of domestic animals. How to improve the breed of horses is one of the problems which these officers have studied. Another is how to make Shorthorns better milkers. They are also trying to develop breeds of animals that are adapted to certain sections of the country; as, for instance, sheep for the western ranges. They study the question of feeds and nutrition, so as to give information about the most economical methods of feeding.

Perhaps the most striking work of this Bureau has been in connection with the discovery of the causes for certain animal diseases. It was in 1890 that the germs of cattle fever, causing an annual loss of forty or fifty million dollars, were found to be carried by a tick. Then, through quarantine rules, and methods of treatment prescribed by the Bureau, the disease was checked. Later, the Bureau tried to find a way to develop a breed of cattle that would *resist* this disease; and in this work it has been successful.

A similar study led to the stamping out of pleuropneumonia, a dreadful western cattle disease. Through the efforts of the Bureau, and by means of the laws that it executes, the foot-and-mouth disease has more than once been checked. No sooner, on any occasion, were telegraphic reports of the appearance of this disease received than the government's experts flocked to the



INSPECTION OF SHEEP

By Officers of the Bureau of Animal Industry.

places indicated and the task of tracing its origin and checking its spread began.

The "dipping" of sheep and cattle on the western ranges is another example of preventive work done under similar direction. It will be a great victory for scientific animal husbandry when we have cholera-resistant swine and tuberculosis-resistant cattle; in the minds of the scientists at Washington, these achievements are not impossible.

An interesting activity of the Bureau of Animal Industry is that directed toward saving the enormous

waste, estimated at fifty million dollars a year, in eggs. It has been discovered that the production of infertile eggs for market will prevent much loss. The Bureau has sent upon long trips through the country an egg car



EGG AND POULTRY DEMONSTRATION CAR

containing exhibits and in which lectures, demonstrations, and advice are given freely. Thus, it is being shown that "taking care of the pennies" will add much to the income of many farms, and, better still, will train the farmers to conduct even the smaller parts of their business in a careful and scientific manner.

Just as this Bureau advances and protects animal life, so the Bureau of Plant Industry aims to improve and protect the plants that make the crops of the farm. Acting also in connection with the experiment stations, the Bureau conducts investigations and makes experiments in great numbers. For instance, its work resulted in the discovery that shallow cultivation was less likely to injure the roots of growing corn than deeper cultivation. It has greatly helped, also, in the breeding of

good grades of corn. About ten years ago, when the cotton boll weevil was doing great damage in the South, the officers of this Bureau made a study of peanut production. The farmers, who were discouraged over their cotton, were shown how best to raise this new crop. Those who tried it were greatly benefited, both in the state of their pocketbooks and in the condition of their fields. In less than twenty years, also, the beet sugar industry has become very important, through the aid of investigations made by the Bureau of Plant Industry.

The diseases of grains and trees are the subject of especial care, and much good has resulted from the study of these matters. It is by the aid of the Department of Agriculture that experts are sent abroad to find the enemies of various diseases, several of which were mentioned in a previous chapter (p. 298). On the borders of our country the government's agents stand ready to inspect all importations of plants, lest diseases should be brought in.

One branch of this Bureau's work — that of exploration and plant introduction — is the natural outgrowth of the government's first efforts to aid agriculture. It will be remembered that, in 1836, officers residing abroad were asked to send home the seeds of plants that might prove to be adapted to this country. Now the government is not satisfied with this simple and haphazard way of obtaining new plants. Instead, it sends experts to the four corners of the globe *to find such plants*. Moreover, these exploring agents are not sent aimlessly, but each with a special mission, to find particular plants the need for which has already been felt in some part of the United States. Of course, incidentally, many other

plants are also procured. Most interesting have been the adventures of these explorers; some have endured severe hardships, even risking their lives, and have had to exercise the greatest skill in order to accomplish their difficult tasks. For in some foreign countries, and among some uncivilized peoples, their work is looked upon with suspicion, and obstacles are placed in their way.



DURUM WHEAT

One of the first of these plant explorers, Prof. N. E. Hanson, was sent to Europe and Asia to obtain plants that would flourish in the dry soils and cold climate of our Far West. The alfalfa originally grown in this country had been bred in southern Europe and brought by way of Mexico to Southern California; it would not endure all climates. As a result of importation, we now have alfalfa that is drought proof. In the same way, durum, or macaroni, wheat was secured from Russia and Siberia. This is so exactly suited to the great wheat growing regions of the Northwest that within five years after its introduction ten million bushels were being raised there annually. Kaffir corn from South Africa has also been introduced into the semi-arid regions.

Another very valuable plant that has come to us as a result of work done by our government's experts is a new variety of rice from Japan. There is a wide belt of land extending along the Gulf coasts of Louisiana and Texas where this rice is successfully grown. Its kernel is hard

and short, and is less liable to become broken in the process of cleaning than is that of other varieties. In consequence, within a few years this crop has doubled and redoubled in value.

There are propagating houses and gardens at Washington in connection with the Bureau of Plant Industry; here new seeds and plants brought from abroad by our



EXPERIMENT STATION FARM
United States Department of Agriculture.

explorers are tested. From here seeds and cuttings are sent to experiment stations and to farmers, who propagate them further; and thus within a short time the new varieties are grown wherever they will flourish.

More than 34,000 new varieties of plants have been brought into this country from abroad. Among other new plants, the following may be mentioned: the navel orange from Brazil, seedless grapes from Greece and Italy, the soy bean from China, Rhodes grass from South Africa, citrons from Corsica, cherries and peaches from Siberia, dates from Chaldea, and macaroni wheat from Italy.

The practice of distributing seed through the Department of Agriculture has grown to enormous proportions. Six or seven hundred tons of it are annually grown or purchased by the government and sent out in some sixty million packages to people all over the country. In one aspect this is not at all commendable. Undoubtedly



PACKING SEEDS FOR CONGRESSIONAL DISTRIBUTION
Department of Agriculture.

much of this seed is actually used in a scientific manner to improve the crops of those who receive it. But it is also true that much of it is sent out by members of Congress merely as a means of keeping themselves in favor with the voters. This comes dangerously near to using public money for improper purposes. This country ought to have outgrown such petty political methods.

From the Bureau of Plant Industry packages of seed are sent to schools, with directions for their cultivation in school gardens.

Something has already been said (see p. 292) about the importance of chemistry in agriculture. The Bureau of

Chemistry in the Department of Agriculture has for its duty not only the protection of the farmer's stock from impure feed, but also the protection of the people against impure food or medicine. It may condemn articles that are injurious, whether manufactured here or imported from abroad. The provisions of the Pure Food and Drugs Act of 1906 are carried out by this Bureau.

Under the Bureau of Soils, maps of different districts of the country have been made, showing the kinds of soil in each. The maps are guides to persons who wish to know where certain crops are likely to succeed or fail.

The Bureau of Statistics gathers from time to time, through its thousands of agents, facts concerning the condition of crops. This information is published, and the knowledge thus secured aids many farmers in the marketing of their crops.

The Weather Bureau has most interesting functions. The government began the work of weather reporting in 1870, when it was carried on by the Signal Corps of the Army, under the Department of War. In 1891 these duties were transferred to the Department of Agriculture, and now there are about two hundred official stations from which weather reports are received at Washington daily. Besides these, there are a great many other observation points. From the reports telegraphed to Washington and other central points, the daily weather bulletin is made out and sent at once to the remotest parts of the land. This is not only a great convenience to the people as a whole; it results in much benefit to farmers.

It is estimated that in the year 1911-1912, warnings of frost saved twenty million dollars' worth of fruit in

California, while flood warnings saved from destruction property of even greater value. In more than five million homes and offices the telephone will give the daily weather prediction to those who ask. Weather maps are studied by a million children in our schools, and many pupils



STATIONS FROM WHICH WEATHER REPORTS ARE SENT DAILY OR
OFTENER TO WASHINGTON

are being taught to make observations in a truly scientific manner.

The Bureau of Entomology is engaged in the study of insects. It not only tries to exclude injurious insects from the country, but also imports those that are beneficial. A number of years ago, fig tree growers in California found that the fruit did not develop as it did in its Old World home. Upon investigation it was found that there a certain insect carries pollen from the flowers of a worthless variety to those of the fruit-bearing tree, and thus fertilizes them. When these facts were dis-

covered, and the insects were imported, the industry became profitable. The citron industry of California is greatly benefited by the work of the government's experts in finding beneficial insects and importing them from abroad.

The Biological Survey studies wild animals and plants. It helps to enforce laws protecting game and other wild animals. In order to prevent hunters from exterminating certain kinds of birds, especially those whose feathers are valuable, bird reserves have been established. The scientists in this office examine the stomachs of birds to discover whether they are injurious to crops.

The Forest Survey studies the subject of trees in order to learn the ways in which they are related to the farmers' interests. It also encourages the pupils in the public schools to observe trees during the different seasons of the year. For this purpose, it sends to schools blanks wherein the pupils may make record of the leafing, budding, and other changes in the trees which they see daily. This much neglected matter is thus beginning to receive the attention it deserves.

In the past, our waste of trees has been almost criminal. The farmers' fields have suffered enormous damage from erosion and from floods because of the reckless clearing of forests. The Survey now has charge of the great national forest reserves,¹ and keeps there a small army of rangers who protect the trees and keep a sharp lookout for forest fires. Through the Survey we are being told that the wood crop of the farmer should be

¹ The locations of the bird and forest reserves, also the Indian reservations and irrigation projects, are shown on the Sanford American History Maps. (A. J. Nystrom & Co., Chicago.)

planted, cared for, and harvested by scientific methods. Thus it will become a valuable asset, not only to the individual farmer, but to the nation as well.

The subject of good roads is one upon which the American public, especially the farmers, need much education. Only within recent years has particular attention been given to it. This has been in part the result of work



FIRST OBJECT LESSON ROAD BUILT BY OFFICE OF PUBLIC ROADS,
ATLANTA, GA., 1895

done by the Department of Agriculture, through its Office of Public Roads. This Office gathers and publishes information about the making and care of roads. It offers instruction as to the materials suitable for public highways and also sends out construction crews to actually build short stretches of road, so that local authorities may see how the work should be done. In one year, recently, it built 134 miles of such roads, in various places, and thus encouraged the building of several times as many miles by those who witnessed the work.

The most important publications of the Department

of Agriculture, besides the *Reports of the Secretary*, are the *Year Book* and the *Farmers' Bulletins*. Recently there has been established the *Weekly News Letter* — a very interesting and valuable periodical which aims to keep farmers informed of recent events and improvements in the agricultural world. Of all its publications, the Department printed in 1912 more than thirty-four million copies. That the information thus printed is considered valuable is shown by the number of requests received for these documents. While in 1897 these requests numbered some five hundred each week, in 1912 there were fifty-two thousand weekly. What better evidence could one wish that the ideas and practices of scientific farming are spreading? And yet, as stated in Chapter XXIII, a large proportion of the farmers of the country are still untouched by the newer scientific ideas, or have only begun to put them into practice. The Department of Agriculture, the colleges, and the experiment stations have accumulated an enormous mass of scientific facts — enough to revolutionize our agriculture within a few years, if they were fully acted upon. All of these facts may be found by the farmers in books and pamphlets that are to be had *free of charge*. Nevertheless, one more step has been lacking to make our agriculture really scientific: i.e. farmers must not only learn but also *act upon* this scientific information. It is said that on our American farms the application of scientific agriculture is twenty-five years behind the discovery and publication of the facts.

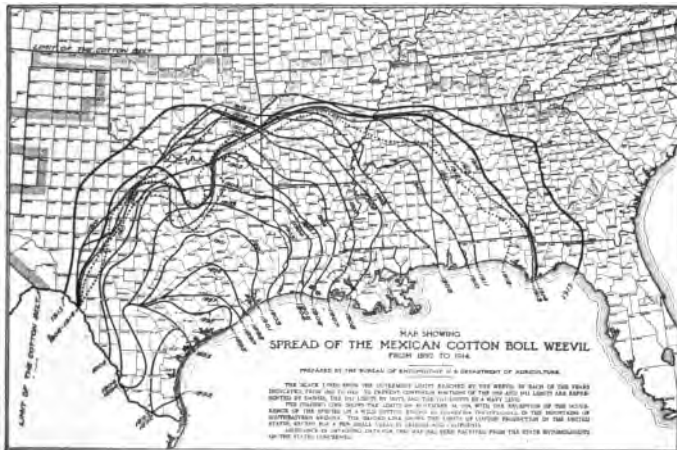
Now, as has been said before, most farmers are by nature slow to accept new ideas and to put them into practice. They *demand to be shown* first. Hence, the

third great step, demonstrating how scientific agriculture will work when put into practice, has already been begun by the Department of Agriculture.



COTTON BOLL WEEVIL

This work had its origin in the years when the boll weevil was ruining the cotton crop of the South. This pest, coming into Texas from Mexico, began its destruc-



tive work about 1892. It spread gradually, at the rate of forty or fifty miles a year, all efforts to check its progress being in vain. Finally, it destroyed millions of

dollars' worth of cotton each year. In 1904, Dr. Seaman A. Knapp, one of the grand figures of our agricultural history, was sent to the afflicted district by the Bureau of Plant Industry. Dr. Knapp studied the weevil and induced the planters to so plan the work of the cotton fields that they were enabled to grow cotton in spite of this pest. By early planting and shallow cultivation, the cotton plant was forced to maturity before the weevil could do much damage.

As a part of his work, Dr. Knapp organized the Farmers' Coöperative Demonstration work, which has spread through many sections of the South, and is being put into operation in other states. The plan is this: from a central office, traveling agents are sent out, who induce several farmers of a county each to devote a small acreage to a certain standard crop, the Department furnishing the seed. The farmers agree to cultivate these crops according to the directions furnished them. This work is guided both by correspondence and by consultation with the agent. The agent holds meetings on these "demonstration farms," gathering there not only the farmers of the vicinity, but also business men and others.

Now, if there is virtue in the seed and in the scientific methods prescribed by the directors of this work, the result will show in better crops; and this has proved to be the case. Corn crops have been from fifty to one hundred and fifty per cent larger, and cotton crops have averaged from forty to more than one hundred and fifty per cent larger on these demonstration farms than elsewhere. Thus, by actual tests, the farmers are being shown that deeper plowing, better drainage,

selected seed, intensive cultivation, the use of fertilizers, and rotation will do all that has been claimed for them by the chemists, the biologists, and all the other experts and professors who have for many years been teaching these things.

In connection with this work, Dr. Knapp also began



BOYS' CORN CLUB

the organization of boys' corn clubs. Each boy who joined such a club agreed to cultivate an acre of corn under the direction of the Department of Agriculture. At first, local bankers and business men subscribed money to purchase the best seed. The boy members of these clubs agreed to study the literature sent out by the Department and to follow its directions exactly. In many instances, when this was done, the boys' crops went far ahead of those raised by their fathers!

Then there were prizes given, generally by the business men, in each locality. Other prizes were awarded at county and State fairs. In 1909, the boy winners of State prizes in Mississippi, Arkansas, Virginia, and South Carolina were given by the Department a trip to Washington, where they spent a week "seeing the sights."

This is only the beginning of the story of farm demonstration work. The corn clubs were followed by clubs for raising many other products, including swine. Girls' canning clubs were next organized, for raising and preserving tomatoes and other vegetables and fruits.

The success of this work in the South has led to the conviction that if a traveling agent, spending a little time in each of several counties, could accomplish so much, then very much larger results would follow if each county had its permanent agricultural expert. How this is actually coming about will be stated in a later chapter. (See Chapter xxix.)

The work of the Department of Agriculture, so far described, has to do with better methods, better crops, and the prevention of loss. Its work does not stop here, for recently (1913) there was established an Office of Markets and Rural Organization, a part of whose work has to do with better living on the farm. A statement of what has been and may yet be accomplished along this line belongs properly to another part of our story.

CHAPTER XXV

THE NEW SOUTH

IN the South, agriculture has always been the most important industry; but, in spite of this fact, it is the section where agriculture has been most backward. Now, however, there are hopeful signs of progress, showing the possibility of a new era. The South, where now only one-fourth of the land is improved, may yet become the garden spot of America.

It has been said (Chapter XVII) that during the Civil War the slaves stayed on the plantations raising the crops as usual. This was not true in the regions that were invaded by the armies. Here, during the war, and throughout the South after the war, the negroes left the plantations either to follow the Union armies or to go to the nearest town or city. Some merely wanted, they said, "to try their freedom on."

When the planters returned home after the war, they found decay and ruin everywhere. Buildings and fences had not been kept in repair, implements and live-stock had disappeared, fields were either barren and eroded or covered with weeds and bushes, and often houses and barns had been destroyed. At Appomattox, in April, 1865, General Grant showed that he realized the needs of the small farmers in the Confederate army when he told them to keep their horses, as they would need them

for the spring plowing. But where were the planters to find laborers for their broad cotton fields?

At first an effort was made to keep the old plantations and to have them worked by the negroes as hired laborers. Some of the negroes, after a time of idleness, consented to work for wages. Two methods were tried. One was the "standing wage" system, under which the farm hands were not paid wages until the end of six months or a year. The idea here was to keep the negroes on the farms. The annual wages varied from \$50 to \$100. Under the "part standing wage" system the negroes were given wages monthly, and in addition each had the use of three or four acres of land which he could work in his spare time.

But under either system the negroes did not like to have the planters exercise control over them, and they no sooner got a few dollars than they quit work and refused to return. The cotton might be choked with weeds or the bolls be spoiling to be picked, but Sambo with a few weeks' wages in his pocket was a free man, and loafed and played until his money was gone. Thus the wage system was soon found to be a failure.

Next, an effort was made to have the negroes work the plantations on shares, each family receiving at the end of the year a portion of the cotton raised. Under the "four day cropping system," the negroes worked four days for the farmer and two days for themselves—land, seed, and implements being furnished by the farmer. But, again, the negroes were restive under the control of their work by the planters. Consequently, in most cases the plantations were divided into small tracts, each worked by a negro family on shares, the white owner still furnish-

ing stock, seed, and implements, as well as land and buildings. Under this system, with less control, crops became smaller because the negro worked fewer hours and with less intelligence. Nevertheless, because he wanted still more independence, the share system has been in many cases abandoned in favor of a pure rental system. Under this plan the white owner furnishes only land and buildings and the negro tenant manages the farm in his own way, paying rent either in cash or in cotton.

At present, besides the large and increasing class of small white farmers, who were numerous in the South before the Civil War, there may also be found many owners of large plantations. But everywhere the Southern farmer, whether black or white, is burdened to a great extent by the credit system. Either because he is without capital, or is shiftless, or because his land is becoming exhausted, he is compelled to borrow or to get supplies on credit between crops. He gets credit from the local merchant or money lender. The security demanded is a "lien" on the cotton of the next crop; so he is bound to continue planting that crop.

Under this "lien system," the farmer who is in debt to a merchant is in a particularly hard situation. The merchant has two prices for his goods, a cash and a credit price, the latter being the higher. The farmer is under agreement to get all his supplies of the merchant; and the latter charges enough to cover not only a very high rate of interest, but sometimes in addition the expense of an agent who looks after his security. At the end of the year, the crop may not be valuable enough to pay the debt at the store. So the poor farmer is forced

to renew the contract; or, he shifts to another farm, in a hopeless effort to better his condition.

It thus came about in the South, during the years immediately after the Civil War, that the mass of the negroes worked under either the share or the tenant system. Many of the poor white farmers also became tenants. The typical farm under any of these systems was the "one-mule farm" that is still too common in the South. Concerning it, a writer in the *Year Book* of the Department of Agriculture (1908) says: "The one-mule farmer can scratch 3 or 4 inches deep with his one-



SHALLOW PLOWING AND POOR CROPS

mule plow from 10 to 12 acres in as many days. If he plows in the fall the winter rains wash his shallow soil away, or repack it. He plants his cotton and corn with a little fertilizer, which he purchases with money borrowed by mortgaging his future cotton crop. His seed is simply ordinary cotton and corn. His cultivation of the growing crop is necessarily laborious and time consuming from lack of proper horse-power and tools. He and his family are too busy walking back and forth, hoeing the weeds and grass out of the cotton and corn, to look after a garden, to raise chickens and pigs, or to take care of a cow.

"The one-mule farmer gets at best one-third of a bale of cotton and 10 bushels of corn per acre. The value of these hardly pays his rent, his fertilizer bill, and his bill for food and clothing. Year after year he goes through the same routine. His children escape to the first factory or mill that comes into their neighborhood."

This represents a very low stage of farming, and it is no wonder that the results are small. The Country Life Commission reported that "the average income of the tenant farmer growing cotton is \$150 a year, and the family does not usually raise its poultry, meat, fruit, vegetables, or breadstuffs."

Thus it is still true, as it was before the Civil War, that Southern farms do not as a whole supply agricultural products for their own consumption. The Secretary of Agriculture, in his report for 1914, states that the farm homes in Georgia produce, on the average, less than two eggs a week. Of butter they produce on the average about two-thirds of an ounce, and of milk about two-thirds of a pint, each day. The average yearly product of these farms is only one-third of a hog, one-twelfth of a beef, and one-hundredth of a sheep. With this output, the yearly cotton crop does not pay for the food that is purchased. In twelve of the Southern states there are still large importations of wheat, corn, and oats. Texas annually spends \$50,000,000 for these grains; Georgia and South Carolina each nearly half as much.

This is a view of the discouraging side of Southern agriculture; but there are signs of better things for the South as a whole. One of these is the increase in the number of farms actually owned by negroes. Many white people do not realize how difficult it is for the

negroes to acquire habits of industry and thrift after living for generations under a system of forced labor. But many of them are now succeeding. It is said that 200,000 negroes own their own farms; that these farms now amount to some 20,000,000 acres; and that the



PART OF THE BUILDINGS AT TUSKEGEE INSTITUTE

total value of farm property owned by negroes is \$500,000,000. It is now a little more than fifty years since the Emancipation Proclamation was issued; with such beginnings, what may not the negro farmer accomplish in the next half-century?

Much credit for the progress of negro farmers may be given to Hampton Institute, Virginia, and Tuskegee Institute, Alabama. Here thousands of young men and women have learned the gospel of good farming. The influence of Booker T. Washington¹ in raising the standards of work and living was very great. He called

¹ By the death of Mr. Washington, in November, 1915, the negro people of the country have been deprived of a great leader.

attention to the fact that for many generations under slavery the negro did the lowest kind of labor. Under a system of forced labor he did not learn to be steady and dependable when not under control. Like other unintelligent farmers, he was at first careless and thriftless; he was unwilling to practice mixed farming, to take care of stock, to buy improved implements, or to cultivate with care. In fact, the traditions of his life were all against any such ways of farming. Now, the effort of the negro's friends is to make him believe that advance is possible, and that he, as well as the white man, may lead a dignified rural life and be respected by all his neighbors.

The work of Dr. Seaman A. Knapp, in connection with the Farm Demonstration work, has been described (pages 319-321). This work kindled a new spirit among the farmers of the South. In the decade between 1900 and 1910, Southern agriculture advanced faster than that of any other section, in respect to increased value of land, buildings, live-stock, and machinery. Its annual production of farm crops more than doubled in value in the ten years. An appreciation of the value of rotation of crops and the use of legumes (clover, cow peas, alfalfa, etc.) to restore the soil is fast spreading.

The white farmers of the South now raise a larger proportion of the entire cotton crop than they did before the Civil War. Cotton culture has spread to new districts of the South, but exhaustion of the soil is very common. Still, for the last decade the price of cotton has been good, and this has given hope as well as capital to the farmers. In former times cotton seed was thrown away; now its immense value is found in the oil extracted from

it, and in its use as feed and fertilizer. Improved machinery helps to plant, cultivate, and gin a better crop; while it seems that the day of a practical cotton-picking machine is really at hand. New crops are being successfully raised in the South — rice on the Gulf coast, and even in Arkansas and Missouri; garden products to supply the Northern demand; and fruits and nuts, as never before. There is also sugar culture with im-



HARVESTING RICE IN LOUISIANA

proved machinery, such as disk plows, harrows, and cane harvesters. Stock is being improved, and fertilization and drainage are coming into extensive use for the first time in Southern history, bringing new life to the black soil of the old cotton belt.

In all the Southern states there are departments of agriculture that are doing much to educate the people upon the subject of scientific farming. Experiment stations and farms are becoming numerous. Such work as that of the Agricultural College of South Carolina in sending out an agricultural train, and that of the North Carolina farmers' institutes and the Georgia "cotton school" is becoming more common every year. It is said that there are 40,000 demonstration farms in the

South, on which farmers are planting and cultivating crops according to the advice and direction of leaders, who in turn are in touch either with state agricultural authorities or experts sent out by the United States Department of Agriculture. As a single instance of what is being done: one of these demonstration farms in Mississippi raised 445 pounds of lint cotton to the acre, when the average product for the state is 228 pounds.

In a previous chapter the organization of corn and canning clubs for boys and girls was described. These clubs are now found in nearly every county of the South, and county boards are offering prizes for their best products. Through this work, the selection of seed, fertilization, and the best use of land are being taught. At the same time there are lectures, public meetings for discussion, more agricultural papers, and the teaching of agriculture in the rural schools. These facts show only the beginnings of the new movement in the South; its possibilities for the future one can scarcely overestimate.

CHAPTER XXVI

IRRIGATION AND DRY FARMING

SOMETHING has been said in earlier pages about the irrigation systems maintained by the Pueblo Indians, at the time of the discovery of America, in parts of the United States now known as New Mexico and Arizona (see pp. 8-9). The early Spanish explorers were astonished to find in this barren region fruitful fields and gardens. There were also the ruins of irrigation works that had been built at a much earlier date.

In Chapter XV a brief account was given of the Spanish missionaries who went northward from Old Mexico and established missions in Southern California and Texas. The art of irrigating was highly developed in Mexico at that time, and it was applied upon the farms and orchards that surrounded these early missions.

The first Americans to use irrigation in agriculture were the Mormons, who began the settlement of Utah in 1847. Our histories tell of the persecutions that drove the people of this sect from their homes in Missouri to Illinois, and how, later, they went from Nauvoo in Illinois into the almost unknown wilderness of the "Great American Desert." Almost the entire Nauvoo settlement, comprising 15,000 persons, with large droves of cattle, flocks of sheep, and other animals, travelled across the state of Iowa and rested for a time in eastern Nebraska. From here a band of their leaders went to find a place of settle-

ment beyond the mountains. This advance company stopped, late in July, 1847, near the Great Salt Lake, and at once began to plant crops in order to raise food for the coming winter season.

The site was in many ways most unpromising. A white crust of alkali covered the ground, which was baked so



ARID LAND BEFORE IRRIGATION



THE SAME LAND AFTER IRRIGATION

hard that some of their plows were broken in the effort to plow it. Sagebrush and scattered tufts of bunch grass were the only signs of vegetation, except the small trees which grew along the few water courses. But the spirits of these men, moved by religious zeal, were undaunted. Probably they had never seen irrigation practiced, or even heard of it. But an ingenious

member of the band suggested that the creek near by be dammed, and thus the spreading waters softened the hard soil and at the same time watered the newly planted seed. Such was the beginning of irrigation by American farmers. Their grain did not develop that year, owing to the lateness of the season, but their potatoes did, and the settlers were thus furnished with seed for the next spring planting.

Year after year, bands of Mormons followed the long and difficult trail across the plains and through the mountain passes to Utah. Often storms and Indians proved fatal enemies to the travellers. But the settlement grew rapidly through the coming of recruits, not only from their former Illinois home, but from the East and from foreign countries as well. During their first year in Utah (1848), the Mormons adopted a system of land ownership and control that had many interesting features. Each head of a family was given a house lot of one and a quarter acres in the city. Farm lands were also given to settlers in tracts varying from ten to eighty acres, according to the distance from town and the circumstances of the owner. Those who followed occupations in town were given five-acre lots outside as garden plots. All might pasture their stock in the common field.

The necessity under which these people worked accounts for the strong spirit of coöperation that we find among them. They were obliged to raise crops enough to sustain the community, which was almost entirely cut off from the outside world. In order to raise crops, water was necessary, so they dug a ditch which was owned in common. Under these circumstances, also, farms had to

be small. Hence the farmhouses were grouped in little villages, and everybody worked for the common good. The fact that the authorities of the Mormon Church possessed and exercised absolute power over the people also accounts for their manner of life.

We find in the conditions that existed among the early Mormons in Utah some features that are similar to the New England town farm life described on pp. 27-31; and also features similar to the life of the French settlers in the Mississippi valley, as described on pp. 173-175. In the first instance, the English custom and the religious practices of the Puritans account for the community method of settlement and farming. The French also followed the custom of their mother country. The Mormon farm communities were molded by the necessity of the situation in an isolated, arid region. In all three cases, the danger of Indian attacks drew the settlers together, and so helped to remove the temptation to settle upon scattered farms.

The first spring after the Mormons reached their new home saw some five thousand acres under cultivation. Then came a calamity. Swarms of locusts, or grasshoppers, descended and devoured the growing crops. But soon, from the Great Salt Lake, came flocks of gulls that devoured the insects, so a little of the harvest was saved. But the next winter was a time of privation in the Mormon settlement. This condition was relieved by the arrival of many miners on their way to the newly discovered gold mines of California. These travellers bought horses, meats, and food at good prices, and sold articles needed by the Mormons.

A few years later an agricultural society was formed

and prizes were offered for the best farm products. The legislature of Utah also offered prizes. Because this colony in the wilderness had to be almost self-sustaining, mixed farming was adopted, and this was favorable for its prosperity.

Next we find irrigation beginning in California, near the gold mines. The water trickling from a sluice often



AN IRRIGATED FIELD

showed that vegetation would grow in desert soils if properly watered. Great profits could be realized from vegetables grown near the mines, so abandoned ditches and sluices were used for irrigation. The same conditions also brought about irrigation near the newly discovered mines of the Pike's Peak region in Colorado.

Another interesting story in which irrigation played a part is that of the settlement at Greeley, Colorado. In 1869, Nathan C. Meeker, who was then connected with the New York *Tribune*, was encouraged by Horace Greeley, the great editor of that paper, to carry out a

plan that he had formed for making a settlement in Colorado. Soon a number of Eastern men and their families came to the site of Greeley and founded the Union Colony of Colorado.

Here the community owned the land; each person obtained a village lot and bought from the colony a farm besides. The proceeds of these sales were spent in building public improvements — a school, library, town hall, etc. The people also built and owned an irrigation system. At first there were hard times; blizzards and locusts almost wiped out the little community. Said one of their number: "Some of us were pretty well pegged out in the contest, and some of us were already dead." But these were persistent pioneers, with high ideals of home and community life. They overcame the results of their misfortunes and won the victory that meant prosperity. They found that their soil would produce the best of potatoes in quantities that yielded large profits. Alfalfa, too, was planted, and a plow was invented for turning it under. Moved by the success of Greeley, other settlers founded agricultural communities in the neighboring counties.

The beginnings of irrigation in Utah, California, and Colorado showed the wonderful possibilities of this method of farming. With abundant sunshine, and a never-failing supply of water, always under control, grains, fruits, and vegetables grew surprisingly well. At first, each farmer carried on irrigation for himself; but there were some serious objections to this plan. When individual farmers built dams and ditches, it was soon found that their interests were apt to conflict. A ditch tapping a certain stream might deprive the farmers

further down its course of a proper supply of water. Hence legal troubles arose, and it was necessary for the state legislatures to pass laws defining the rights of water users. Then, too, it was soon found that irrigation works were necessary on a larger scale than the individual settler could afford to build. Hence, in the period beginning about 1870, many irrigation companies were formed in the arid districts. These companies sold shares of stock, thus obtaining money with which to build the dams and ditches for systems that watered many square miles of land. They also received payments from farmers at certain amounts per acre for the water rights that the latter enjoyed. In many cases the irrigation companies met financial failure because the lands were not settled quickly enough, or because the settlers could not afford to pay the water rentals during the first few years of farming on the new land.

In 1894 Congress passed the Carey Act, with the purpose of opening to settlement the arid portions of the public domain. This law gave to any state the control of a million acres of arid public lands within its borders. The state might make a contract with an irrigation company, which in turn constructed an irrigation system for a certain district. The state then sold land in this irrigated district, and the company sold the water rights to settlers. After both had been paid for, the water users formed an association that finally owned the irrigation system.

A new epoch in the history of irrigation began when Congress passed the Reclamation Act in 1902. Under this system, when the government sells land in any of the states of the Far West, the proceeds are put into a

By 1913, irrigation works costing over \$13,000,000 were completed, and others were under construction. In bringing the water to these desert lands some remarkable work has been done by the government's engineers. There is, for instance, near Boise, Idaho, the highest dam in the world; in New Mexico the largest artificial lake (sixty-five square miles); and in Colorado the largest tunnel. There are over 7,300 miles of canals bringing water to 14,200 farms that include more than a million acres. On these lands, crops worth \$2,000,000 are now raised yearly.



IRRIGATION PROJECTS OF THE U. S.
GOVERNMENT
Sites of dams and reservoirs.

The results of this important work, however, have in some ways been unsatisfactory. The greatest difficulty, perhaps, is the fact that farmers to occupy the



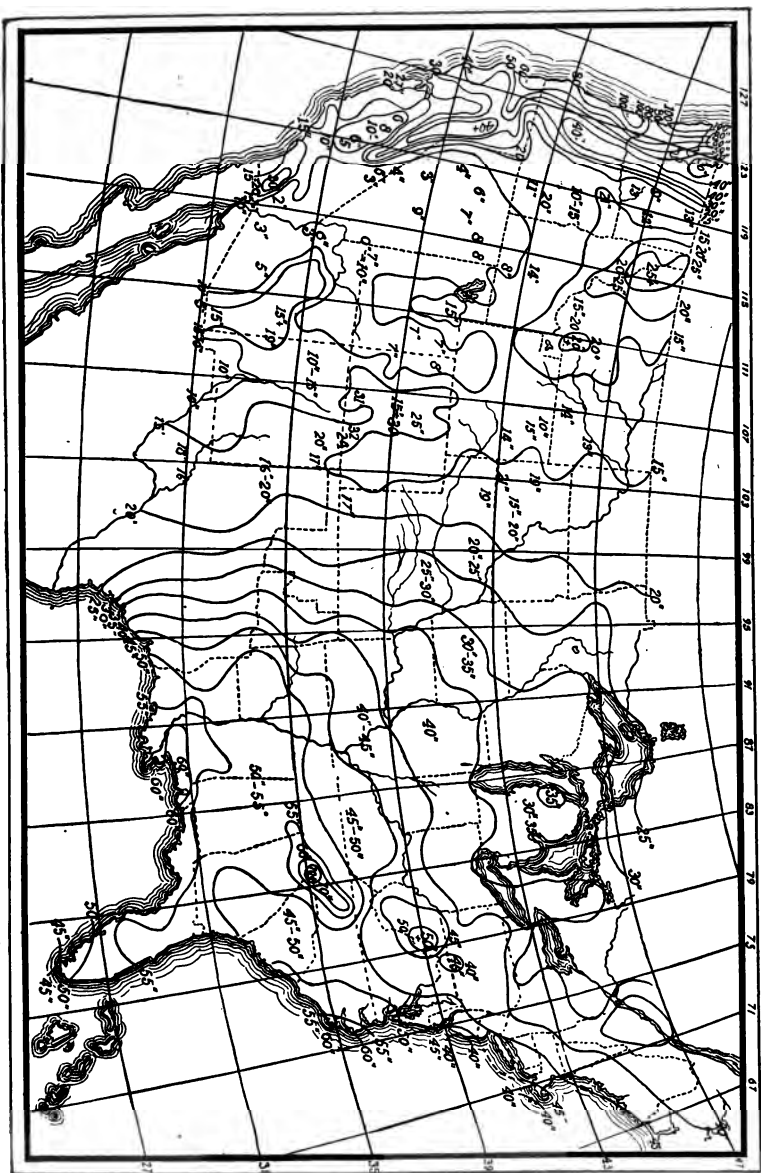
IRRIGATION CANAL, PLATTE CAÑON

irrigated sections have neither been numerous enough nor, in some cases, of the right kind. The length of time that is required for a farmer to learn the proper methods of irrigation farming has been underestimated. So, too, his ability to make payments during the first few years of settlement has been overestimated. The cost of constructing the systems has also been higher than was expected. Unforeseen problems have appeared

after the water was turned onto the land: for example, difficulties in drainage, and the bad effects that sometimes follow the irrigation of alkali lands. As a result, further construction work has been halted, and farmers have been given additional time in which to make payments for land and water rights.

Some interesting results have followed in agricultural communities where irrigation is used. Scientific irrigation goes far towards making farming a certainty, so far as results are concerned. Then, too, because irrigation

AVERAGE RAINFALL OF UNITED STATES. (U. S. WEATHER BUREAU.)



involves expense, and land becomes very valuable, intensive farming and scientific methods are necessary. Moreover, farms are of necessity smaller than elsewhere. In many instances farmhouses are built in villages, as they are in Europe. Where this is true, a more active social life is possible, centering in schools, churches, and other organizations. Coöperation is also encouraged. When men live and work together in harmony, the spirit of good will and a democratic feeling are quite sure to prevail. It then becomes possible for men to advance to a higher plane of living than that of mere money-getting; and thus are corrected some of the evils that became apparent when Americans occupied the wide prairies of the interior.

Between the region of adequate rainfall and the arid mountain lands of the Far West lies a strip known as the semi-arid district. The rush of settlers into Kansas and Nebraska after the Civil War carried many eager settlers beyond the limit of reliable rainfall. During a few wet years in the early eighties, thousands of them entered the semi-arid district. When the dry years came, their crops died and they saw all the savings of years wasting away before their eyes. There followed a time of the greatest suffering and privation. Many farms were mortgaged; many were abandoned.

After these settlers realized that they were in the region of insufficient rainfall, some were encouraged to remain by the belief that the settlement of such a country increases the rainfall. In other words, it was the theory that the cultivation of crops and the growing of trees causes greater precipitation. Some held a theory that rainfall may be produced by artificial means, especially

by the explosion of heavy discharges at high altitudes. The United States government even tried experiments of this nature. Elaborate preparations were made for setting off explosives from balloons; and, as reported by the officer in charge, the result was "a loud noise."

Meanwhile, facts in connection with irrigation were being learned that were to prove very helpful to the



DURUM WHEAT UNDER DRY FARMING IN WYOMING

farmers of the semi-arid region. In Utah, it was discovered on one occasion that, when an irrigation system broke down, crops nevertheless grew. Interesting results followed experiments that were tried in Utah, Colorado, and Washington, before 1880. It was found that by deep plowing, especially in the fall, and by frequent cultivation of a field after the crop was taken off in the summer, the moisture could be kept from evaporating. In dry years, then, good crops could be raised. This was the beginning of "dry farming."

The man who became most prominent in the study and practice of dry farming was H. W. Campbell, whose farm was located in the northern part of South Dakota. After a severe crop failure, he set about finding a remedy for the disasters of dry years. It was his idea that the soil should be packed somewhat below the surface, and then that the surface should be thoroughly pulverized. Thus evaporation would be prevented. Mr. Campbell invented a sub-soil packer with which to carry out his idea. The result of his work was that he raised fine crops when other farmers failed. He was later employed by railroad companies to teach the methods of dry farming to western farmers and to run model farms.

As fully developed, dry farming calls for the following steps in cultivation: disking and plowing the land after the harvest, followed by the use of the sub-surface packer and the smoothing harrow. The land is disked deeply after each rain, and in alternate years, or more often if necessary, is tilled throughout the summer, without raising a crop.

Much enthusiasm for dry farming was awakened over the success of Campbell and others, and the railroads and experiment stations took up the matter, giving aid and advice to farmers in the dry belt. In 1907 a Dry Farming Congress was held at Denver. Many million acres of land have been opened for settlement and culture that had before seemed hopelessly arid. But perhaps the best result has been that once more farmers have been shown how study and investigation into the laws of nature, rather than reliance upon tradition and guess-work methods, will overcome the greatest obstacles in agriculture.

CHAPTER XXVII

THE BUSINESS OF FARMING

AMERICANS have been called a wasteful people. The truth of this charge must be admitted when we compare their ways of living and some of their business methods with those of peoples in certain foreign countries. Perhaps in no other business has waste been more general than in farming. By waste in farming is meant lack of economy in the use of land and labor, and in the conduct of business transactions. The reckless wearing out of our land, for example, has been so frequently mentioned that no further explanation of it is needed. Scientific farming is now teaching better methods in the treatment of the soil. Again, all the different ways in which animal and plant diseases are being checked are merely methods of preventing waste.

The waste of labor has been caused by the farmers' slowness in adopting improved machinery; this is now being rapidly overcome. But farmers are only beginning to realize that they are also wasteful in the *management* of their business, and that better business practices are just as necessary as better machinery and better methods of cultivation.

What is meant by "better business methods" on the farm? Very much the same as would be meant if any other industry were in question. In fact, we are now realizing that farming is a business, just as are manufacturing, commerce, and transportation; and we see that

in respect to improved business methods it has lagged behind the others. In the latter industries there is much organization and careful management of details, and also much study of economical methods. But how may the average American farmer know, for instance, that he is distributing his time and labor upon the various parts of his work in the most economical manner? "How many farmers," asks the *Agricultural Year Book* for 1908, "can tell what it costs to make a bushel of grain or a ton of hay, a pound of meat or butter, a quart of milk, or a dozen eggs?" Have not farmers from the beginning arranged their crops and their work in a hit-or-miss fashion, based upon guess-work or upon custom? In fact, they have had no guide in such matters, except "experience," which might be either good or bad.

As a result of the lack of proper management in farming, it is estimated that the average farmer is paid, for his hard labor and his investment of capital, only fair wages and a low rate of interest — from two to four per cent. In no other line of business would the proprietor and manager be satisfied with such small returns. In fact, in many cases, farmers would do better to sell their property, invest its value elsewhere, and work for wages. These statements are not true, however, where land is new, or where scientific methods are followed.

One reason for the general condition noted above is the failure of farmers to ascertain whether certain parts of their business are profitable or not. Often they do not know whether it is more profitable to keep stock or to sell it; to break a meadow or to keep it in hay or pasture; to feed a crop or to market it. Many times they do not know whether a horse or a cow pays for its cost.

These things cannot be known without accurate methods of keeping accounts, such as are employed in other lines of business. In recent years we have seen the beginnings of interest in *farm accounting*, which is certain to remedy these defects.

If the farmers may be blamed at some points for their lack of business success, there are other ways in which they are not so much to blame. One reason for poor business methods in agriculture is *lack of organization*. While those who manage city industries (manufacturing, banking, mercantile business, and transportation) have taken step after step in the last half century to combine their capital and to work in harmony, most farmers have been isolated, each individual working independently. This comes from the scattered location of their farms and from the nature of farming itself. But it places the farmer face to face with a combination of those with whom he deals in other lines of business. Coöperation in farming, while it has had some success, as will be seen, is not yet widespread.

[Before the Civil War farmers began to realize that they were at a disadvantage in dealing with merchants and railroad companies, and about 1850 they began to form societies to secure better terms. In 1858 there were nearly a thousand such organizations.] The Civil War seems to have interrupted the progress of this movement. The dairy business, as stated in Chapter XXII, was one of the earliest in which farmers combined for their own advantage. Coöperative societies of this kind are still flourishing, there being in the United States in 1914 more than two thousand creameries conducted on this plan, besides several hundred coöperative cheese factories.

After the Civil War, other coöperative farmers' organizations were formed in connection with the Granger movement (see Chapter XIX). When the farmers were suffering from hard times and unfair treatment, they were driven to combine in order to fight certain abuses. At this time they formed a large number of selling associations, as well as coöperative stores where they could make purchases. While some of these enterprises were successful, many others failed.

There were several reasons for the failures. Lack of good business methods was one, the farmers not being trained in this respect. Another was lack of good business management; they would not pay salaries high enough to secure capable business managers. Still another reason was suspicion and jealousy, or lack of the true spirit of coöperation, among the farmers themselves. However, some good results came from these attempts. They helped to bring about the reduction in the prices of machinery — reapers from \$275 to \$175, threshers from \$300 to \$200, wagons from \$150 to \$75, and sewing machines from \$75 to \$40. Again, it has been seen (p. 232) that partly as a result of the agitation carried on by the Grange, railway rates were controlled and reduced.

In more recent years other organizations have been formed in which coöperative buying and selling is a feature. Such are the Society of Equity, the Right Relationship League, and the Farmers' Educational and Coöperative Union of America. The last mentioned society reports its members as three million in number, and it has, of course, other purposes besides those of business.

Among the enterprises undertaken during the Granger

agitation were the coöperative elevator associations in the western states. The owners of the elevators along railway lines had a monopoly of the business, at many points, and paid such prices as they pleased. The farmers' coöperative elevator companies increased rapidly in numbers, but later temporarily declined. To-day they are about 2700 in number.

At the time of the Granger movement, many farmers' mutual fire insurance companies were also organized. Because farm property is peculiarly liable to loss by fire, and because it has slight protection, the regular insurance companies charged high rates. The farmers' companies operated upon two general plans: first, premiums might be charged, from which expenses and losses were paid; second, there might be no premiums, but assessments instead, from which losses were paid as they occurred. These companies, when well managed, have been of great benefit and have greatly reduced insurance rates for farmers. Besides taking fire risks, the companies also write hail, tornado, and live-stock insurance.

The telephone came into use about 1880; but it was not until the patents on the instruments had expired, in 1893, that rural lines were built. Farmers found it necessary to combine in order to get this improvement, for the telephone companies that served the cities either would not build country lines, or charged excessive rates. Consequently, a group of farmers would form a company, turn out to set the poles and string the wires, and then pay expenses out of a common fund. In some cases they used the top wire of wire fences, instead of building a new line. These mutual, independent telephone companies had many good results. They also had hard

experiences, because the larger companies opposed them and refused to make connections with city and interurban lines. Many of the rural companies were afterwards bought up by the capitalist companies.

As has been stated, in the business of buying and selling the farmer who acts for himself is in a particularly difficult situation. He must buy at prices agreed upon, in many cases, by a group of sellers. He must often sell his product for what it will bring, to dealers who combine in keeping the price down. Sometimes, the dealer who buys from the farmer is also the one who sells to him; he thus makes a double profit.

In recent years the subject of marketing has attracted much attention, and many bad conditions have been discussed. For instance, it is said upon good authority that potatoes sold from the field for \$8,500,000 cost the people who finally bought and ate them \$60,000,000; that cabbages sold in New York by farmers for \$1,800,000 brought the retail dealers five times as much; that milk for which the dairymen were paid \$28,000,000 was finally sold for \$48,000,000. "Of \$146,000,000 paid annually by New York City for eggs, milk, onions, and potatoes, less than \$50,000,000 was received by the farmers." Thus, it is estimated that the latter receives on the average about thirty-five cents for produce that costs the city consumer one dollar. Many farmers have had experiences like that of the Oklahoma melon raisers, who received five cents apiece for melons that sold in St. Paul and Minneapolis for sixty and seventy-five cents. Here, indeed, is great injustice, for it cannot be believed that all this expense in handling farm produce is necessary.

How can farmers get a fair share of the sale prices of their commodities? This is a difficult problem, but one part of the solution will doubtless come through marketing associations. Indeed, considerable success along this line has already been achieved. There are now in the country 8,500 marketing associations. Such an organization is apt to be most successful among farmers who make a specialty of a certain crop. These have the same conditions and problems to face; they sell in the same markets and buy their supplies from the same source. Examples are found among the growers of such crops as apples, celery, tomatoes, onions, and melons. Many of these have combined to do business with dealers, and have found it profitable.

The best example of success on a large scale is seen in the citrus growers' associations of the Pacific Coast states. Soon after 1890, the production of oranges, lemons, etc. became much less profitable than it had previously been. While not one-tenth of the present output was then produced, the supply seemed to exceed the demand. Buyers dictated the prices and there was much loss from the spoiling of fruit. Investigations made by the Department of Agriculture showed that the decay of the fruit was caused largely by careless handling and packing.

Local fruit raisers' societies were then organized to meet this problem, and the present California Fruit Growers' Exchange is now the most important of the organizations which developed out of that need. Its work has been successful because skilled gangs of pickers and packers, with skilled managers in charge, were employed to handle the fruit. Sometimes the fruit was

packed at central stations. Strict regulations, which the growers must obey, were adopted for the treatment of the trees and fruit. By negotiation with distant dealers better terms were secured; and the railroads were obliged to give better rates. Then, too, the growers organized to do the work of irrigation, spraying, and pruning and to buy supplies in quantities. The result is that the quality of the fruit has been improved and held to a high standard; sale for an enormously greater quantity has been found; and the growers have learned to act together, each finding his own interest in the interests of all.

In connection with marketing, one cannot fail to see the lack of business economy in the carrying of produce from farm to market. The cost of hauling by wagon over country roads is a matter which farmers are only now beginning to study. It is estimated that there are at present 2,300,000 miles of country roads in the United States. The cost each year of maintaining these roads is said to be about \$200,000,000. Finally, of this amount, good authorities state that from thirty to forty per cent is wasted. Of course, the farmers who pay the taxes bear the burden of this waste. They also bear the burdens that poor roads involve in other ways: loss of time in travelling back and forth; loss in the unnecessary "wear and tear" of wagon and harness; the injury done to the horses. Moreover, there is the loss involved in the farmers' being unable to reach market with produce when prices are good. All of these are items of which any good business man would keep strict account.

Consider the fact that the average cost of hauling a ton one mile on country roads is twenty-five cents; and

that on good macadam roads this cost may be reduced to eight cents. Any country boy can make an estimate of the actual expense to his father of the hauling that the latter is obliged to do on bad roads.

The history of road building in the United States is of much interest. In colonial times, wherever possible, the ocean, bays, and rivers were used for travel and transportation. The farmers were too busy and too poor to spend their time upon the difficult work of making roads. Land travel was for the most part on horseback, and carrying was by the pack horse. The saddlebags always hung over the pommel of the saddle in front of the rider; and two double crotched tree limbs fastened together made a secure burden holder on the back of the pack-horse.

Since colonial times, each successive new frontier, from Atlantic to Pacific, has offered the same general conditions and the settlers have suffered from the evils of poor roads. After the year 1800, and especially after the War of 1812, great interest was aroused in the subject of road building. The East was becoming more thickly settled, and the people of the West found that the value of their land and crops depended to no small extent upon their having easy means of transportation between the two sections of the country.

There followed the great era of road and canal building. Scores of toll road companies were organized, and they invested their capital in building roads of plank or stone. The process of macadamizing had come into use about the beginning of the nineteenth century. The companies hoped for profits from the collection of tolls. At certain distances along the improved roads there

were toll houses, with gates. Here the keepers collected toll for each person, wagon, or animal that travelled over the road. The United States government finally took up this important matter and built the National, or Cumberland Road, which ran from Maryland to Illinois, and cost more than four million dollars.

Two events brought an end to this era of road building. First, the failure of many turnpike companies, and the hard times following the crisis of 1837, discouraged such enterprises. Second, the rapid growth of railroads, at that time seemed to render road building on a large scale unnecessary. So it came about that, during the half century that followed, little attention was paid to this subject, with the consequence that the roads from the farms to the railway stations suffered.

This does not mean that no work was done upon these roads. They were everywhere in the charge of local communities, and the most common system for keeping them in good condition was that of "working out road taxes." The farmers with their teams gathered on certain days when farm work was not pressing. While spending a fair proportion of their time in loafing and gossiping, they managed to scrape more or less dirt into the center of the road, from which it was washed by the next heavy rain. In the meantime the "improved" road was too rough to drive upon, so a new path was made at one side; this, in rainy weather, became a sea of mud and water. There was no expert direction of this work — nothing but the "practical" knowledge of road making that every farmer was supposed to have. The result was not permanent improvement, but waste.

This was not only bad road making, but also bad

morals and bad citizenship. The farmers who cheated the town or county in such ways cheated themselves, and set a bad example for the rising generation. Some may think this too strong a statement of this great evil in our agricultural history, and doubtless there were many cases in which the situation was not as bad as that pictured. Nevertheless, the system as described did much to retard rural progress.

The last twenty-five years have brought about an awakening upon this subject. It is now realized that the town, or even the county, is too small a unit to have entire charge of this important business; and that there is a science of road building that is understood only by those who have studied it. In 1891, New Jersey became the first state to vote aid to the local governments for road construction. Numerous other states, in rapid succession, followed this example. The work was put in charge of capable engineers, and thousands of miles of good roads have since been built.

The work of the Department of Agriculture in fostering this movement has been mentioned (see p. 317). In 1893, Congress appropriated money to be spent by the Department in the spread of information upon the subject of good roads, and later the appropriations were greatly increased. In 1912, half a million dollars was voted by Congress for the aid of state and local governments in building roads, on the condition that the latter should spend twice as much in taxes as the amount received from the national government.

The use of bicycles and automobiles has greatly stimulated the good roads movement. In 1914, there were nearly two million automobiles in the country, and the



1. The road in its original condition.



2 Laying the foundation course.



3. Finishing the road.

ROAD MAKING BY THE NATIONAL GOVERNMENT

This road in Tennessee was selected for improvement as an object lesson. The photographs were furnished by the Public Roads Inquiry Office, Dept. of Agriculture.

\$12,000,000 paid to the state and local governments in fees by the owners was added to the funds raised by taxation for the purpose of road improvement. The agricultural colleges in various states now give courses of instruction in this subject. So the future of good road building seems assured. Meanwhile, the coming of the rural free delivery system gave a great impetus to the movement, for the service was extended only where there were good roads. More recently, the parcel post system has had a similar effect, because it makes ready access to markets still more desirable. The Department of Agriculture holds parcel post exhibits at county fairs and elsewhere, showing farmers how products may be packed and shipped. Postmasters also furnish lists of farmers and consumers, who may thus come into touch with each other and deal directly, instead of through middlemen. Express companies, under the stress of competition, have begun to undertake a similar service. They have special departments working in both city and country. In the former they organize consumers' clubs whose members wish to get products direct from the farm. In the country the agents look up sources of supply for these customers. Thus the farmers get better prices, and the consumers buy fresher products at lower prices than is the case when commission merchants, brokers, and retailers come between them.

In many sections of the country, trolley lines and motor trucks are helping farmers to solve the difficult problem of marketing. The use of motor trucks, instead of wagons, drays, and steam cars, reduces the number of shifts necessary in hauling farm produce from field to kitchen — a great economy. It tends to eliminate some of the

middlemen; for, with quicker delivery, the farmer can more easily reach the final consumer.

The trolley line saves a great deal of the farmer's time. It enables him to do the work of three days (one each for going to town, selling, and returning) in one; or, it does away with the all-night hauling for many truck farmers. As in the case of hauling on good roads, or hauling by truck, the use of the trolley results in a great saving of perishable produce, which reaches the consumer in much better condition than it otherwise would. Besides, the farmer is enabled to reach market when prices are at the right stage.

Farming as a business has always suffered a handicap on account of conditions affecting the credit of those engaged in it. Farmers as a class are borrowers, but perhaps no more so than other business men. Merchants, manufacturers, and the managers of corporations, both small and great, depend quite largely upon borrowed capital; and they must make large enough profits to enable them to pay the interest charges. The striking feature about loans made to farmers is the *high rates of interest* they are obliged to pay. These rates are considerably higher than those in any other line of business equal in security to that of farming. In New England and the Central States, the average rate (six per cent) is perhaps not excessive; but in the South and Southwest the rates average from eight to twelve per cent; while in the Far West they range from ten to as high as fifteen per cent. The cotton growers of the South are said to pay, on the average, twenty per cent. There are individual cases, in that and other sections, where the farmers pay even more than this.

What reasons may be found for this condition? First, we may repeat the general statement that throughout our history the farmer has been, on the whole, a poor business man. The city capitalist has thus been able to take advantage of the farmer's ignorance or carelessness. Enough has been said about the credit system in the South (see p. 325) to explain the trying situation in which many a Southern farmer has become involved. It is no wonder that his interest rate is so high.

Previous chapters have emphasized the fact that from the beginning much of our farming has been done under pioneer conditions, far from the centers where capital may be borrowed. Naturally, this fact has caused lenders to expect high rates, owing to the uncertainty of the security. Then, too, it has been shown that Western farming has been largely *speculative*, i.e. the farmers have depended for their profits upon the rise in the value of their land, rather than upon yearly crops. In any business, of course, speculation increases the risk and so raises the interest rates. Under these conditions, also, there was (and still is) much poor farming. It has been shown (page 293) that there is still very much moving about of farmers from one place to another. These conditions all tend to give the business as a whole the reputation of being unstable. Consequently, money lenders feel justified in charging high rates of interest.

Let us excuse the really good farmers, and those whose farms have solid value, from blame in this connection. They suffer from the lower business reputation of their neighbors. Moreover, the bankers are in part to blame. Hitherto they have not taken such pains as they might to investigate the security for farm loans — not so much

pains as they take in other lines of business. They have not distinguished properly between the good and the poor farm loans. There is now a movement among bankers to change this situation, which will result in much benefit to the farmers who deserve credit on low terms.

The last reason that may be given for high rates of interest on farm loans is lack of coöperation among farmers. In this, as in other transactions, the individual farmer dealing with a combination of city business men gets the worst of the bargain.

It is estimated that the farmers of the country are debtors to the amount of more than six billion dollars. Moreover, their indebtedness has been increasing. In 1890, twenty-eight per cent of the farms of the country were under mortgages; twenty years later, in 1910, thirty-three per cent were mortgaged. Now, this is not necessarily a bad sign, for in these years the value of farm property increased at a more rapid rate than the indebtedness. Our era of scientific farming and the employment of new farm machinery calls for larger investments of capital. These new features of farm life, while they make borrowing necessary, also make the property that is security for the debt more valuable and more stable in value.

Under these circumstances, it is not surprising that there has begun, within the last five years, a movement for making better conditions in the matter of rural credits. In 1913, a large commission, composed of delegates from twenty-nine states and seven persons appointed by the Federal government, went to Europe, where they studied this subject. They found that in more than one country the farmers coöperate in having their own credit associa-

tions. That is, farmers who can loan even small amounts place their savings in the charge of the association and from this fund those who need money can borrow at reasonable rates. Their interest payments become the compensation of those who deposit. Thus the business is managed without profit, only the necessary expenses being paid.

Somewhat similar credit associations have already been begun in this country, the earliest being those of Jewish farmers in Connecticut and New Jersey (1911). The movement is bound to spread. Probably, as in the case of other coöperative enterprises, mistakes will be made and farmers will suffer in consequence. But in the end a safe and workable system adapted to the needs of the farmers will be established.

In 1916 Congress passed the Federal Farm Loan Act, providing for twelve farm loan banks throughout the country. Farm loan associations have been organized, composed of farmers who wish to borrow money for the purpose of enlarging or improving their farms. The borrowers give to the banks mortgages on their property; the banks obtain the money which they lend by selling bonds to the public. The security behind the bonds consists of the mortgages given by the farmers. These must make annual payments upon the principal of their debts, besides the interest, which is lower than could be secured by borrowing from individuals.

The succesful coöperation of farmers in this, or any other, enterprise has much more than merely financial results. It gives them valuable business experience. It also helps to break down the feeling of isolation and to build up the feeling of loyalty and fellowship that should be strong in every community.

CHAPTER XXVIII

RURAL LIFE

THE story of life on the farm "when grandfather was a boy" has fascinated many a city child. It is the tale of a happy household where every day brought stern duties and hard labor, but also many simple pleasures. In summer days both duties and pleasures had the taste



"GRANDFATHER'S HOME ON THE FARM"

of free out-of-door adventure; while the winter evenings saw a jolly company gathered about the fireplace, with apples, doughnuts, and games. The old-fashioned, roomy house was furnished in quaint style; the pieces were simple but substantial, such as are now repolished and placed in our best apartments. The parlor was a dim, musty room, with chairs and sofa upholstered in hair-

cloth. The huge family Bible, with its records of births, deaths, and marriages, and the "what-not," with its curios, had prominent places. In the large kitchen, strings of dried apples and pumpkins were conspicuous. The bedrooms were very cold in winter, but the bedding included plenty of woolen blankets and feather ticks. Religious life about the family altar was earnest; social life, with congenial neighbors and hosts of relatives, was free and wholesome. Husking bees, quilting bees, spelling matches, singing school, sleigh rides, and parties gave variety and interest. There were few books, but they were good. The weekly newspaper kept the older people abreast of the times and in touch with serious national problems.

It is memories of such a farm and home life that cause many people of our own time to look back with regret upon the "good old times" that seem to have passed forever. For this description applies in the main to the years before and immediately after the Civil War, in the eastern and northern portions of the country that were well settled by American families. When agriculture had spread out upon the broad prairies, there was a change in the general character of farm life. As the farms became more scattered and isolated, social events were less frequent. Rural population became more mixed by the coming of different nationalities; so there was a lack of the old-fashioned good-fellowship. The use of machinery, on the larger Western farms, and the growing of "money crops" made life, if not more strenuous, at least more hurried and unrestful. The farm home, too, became different. The cheaply constructed frame house was filled with cheap factory furniture; gaudy and in-artistic decorations appeared. This was no "homestead"

such as that of the olden time, where one generation followed another. This one might be "sold out" at any time when a good price was offered. And as the homes became less substantial and less permanent, the best things of life — those that appeal to the mind and the spirit — seemed in part to lose their hold upon the people who dwelt in them. The school and the church, and all the good things that are associated with them, came to occupy a less prominent place in the life of the community.

Here is another picture of farm life that will perhaps awaken memories in the minds of many. "My recollections of the farm consist in going barefoot through the frosty grass along about daylight after the cows; in having to carry the wash water up a steep hill from the spring before breakfast, in order to get time to gather sheaves after the cradlers and binders; of the stubbly grain field the rest of the day; of having to go out after supper for another load of hay, and then of hunting up the cows again and helping to milk them until after bedtime; of seeing my mother, sober faced and weary, dragging herself, day after day, about the house with her entire life centered upon the drudgery of her kitchen, and all the rest of the world a closed book to her; of seeing my father, broken down with long hours and hard work, finally relieved of the task of paying for the old place — just a few months before he died." This man hated the farm, because it had deprived him of a natural childhood and sweet home memories.

It may be that descriptions such as this apply to many farm homes of our grandfather's time; and it is undoubtedly true that in the more recent times there have been

many farm households rich with pleasures and elevating influences. There are exceptions on both sides. Our present effort is merely to describe the two types.

This will serve a useful purpose, for it is necessary to find reasons for a very important fact in our agricultural history: viz., *that boys and girls have been leaving the farm for the city in large numbers.*¹ This movement, while it has always taken place to some extent, has been particularly rapid in the period since the Civil War. May not one reason be found in the changed character of rural life in this more recent period?

Many have gone from country to city because hard physical labor was not to their liking. Many others, one of whom (Supt. L. D. Harvey) may be quoted, would say it was not because of the hard work. "There was enough of that. It began when the stars were shining in the morning and did not end until they shone again at night. I know what long days and hard work mean. But that is not why I left the farm. *I left it because hard work was all there was on the farm.*"

It has been suggested, too, that fifty years and more ago farm life had as many social attractions as town life, if not more. After that period, the social life of the town became quickened, while that of the country suffered by comparison, and in places it actually declined. Hence, many young people have sought the lights, the attractions, and the opportunities for social life that the city offers.

¹ It is maintained by some that those who have left the farms in the East have gone, not so much to cities, as to the farms in the West; while our cities have grown chiefly from immigration. The statement made above does not attempt to estimate the relative numbers going to cities. See Gillette, *Constructive Rural Sociology*.

In the city, too, were better business opportunities for the country boy and girl. Steam power helped the city much more than it did the country. It built up the city industries — manufacturing and commerce — and gave business opportunities far beyond those that could be realized on the farm.

There came a time, then, when the farmer's reputation fell in public opinion — first in the opinion of the city dweller, and then in his own. He became a "hayseed," a "clodhopper," or a "Rube"; then the "funny picture" artist tried to show everybody how ridiculous and barren his life was. The farm boy became ashamed of his father's occupation and the mother dreaded to see her daughters stay on the farm and repeat her own experience. So the young people went to the city, and when the old folks died the farm was "abandoned." Or, the children having left, if the parents were "well off" they moved to the nearby town, where life was more comfortable. Here they spent their last years, continuing to deny themselves pleasures and luxuries, much as they had done in earlier years.

It can readily be seen that the increased use of machinery has helped the movement toward the city. Farmers' sons and hired laborers found that their help was not needed when machines did the work of human hands. At the same time there was a growing need and good pay for labor in the factories where these machines were being made, and in the business of selling them. So there were both good and poor reasons why the young people left the farm.

One of the poor reasons was based on the feeling that the artificial sights and surroundings of city life are .

superior to the natural ones of the country. There were, and still are, those who "think that an electric light is more beautiful than a sunset; that shop windows are more beautiful than trees and flowers; that crowded streets are more beautiful than the open fields; that one of our modern plays is more beautiful than an out-door



MODERN FARM HOME

pageant." Of course, they are mistaken, and in these days many people are gaining better ideas upon the subject.

In fact, we now hear much of a movement in the other direction, "back to the farm." City dwellers, tired of factory and office, are trying to become farmers, generally specializing in some product, such as poultry, berries, or vegetables. By the aid of the state governments, abandoned farms in the East are being sold to occupiers. Great numbers have gone to the Far West, attracted by accounts of riches drawn from fruit orchards and irrigated farms. Many of these movers from city to country have met disappointment; others have made a success of the new life. Certainly, there are ways in which the country

is superior to the city. Here children live a more natural life; here less of evil is to be seen, and here one may find interest in a multitude of nature's secrets of plant and animal life. These reasons will continue to draw people to the country.

But the movement from city to country is of very small importance in comparison with changes that are coming about in the life of the country itself. One must not expect to cure the ills of rural life by filling the farms with people from the city; nor, indeed, to cure the ills of city life by emptying its population into the country districts. The people of each kind of community must solve their own problems, and thus lift themselves above the bad conditions that trouble them.

There has been no time in our history when so much progress was being made in this direction as at present. The conviction has been rapidly spreading, within recent years, that however important scientific agriculture, better business methods, and more profitable farming may be, there is another serious need — a better rural life. President Roosevelt, in appointing the Country Life Commission, struck the key-note of the matter when he said: "Good crops are of little value to the farmer unless they open the door to a good kind of life on the farm."

The happy farm life of grandfather's time will never return; but conditions are now showing improvement in so many ways that we catch glimpses of a new rural life that may be even better than the old. The use of machinery has helped in this direction, and its influence is not yet at its height. The telephone has broken down, in part, the isolation of farm life; so have the rural free delivery mail service and the parcel post. News from

neighbors, letters from friends, easy contact with the outside world, quick business transactions — all these make the farmer and his family feel that they have a part in the active life that stirs everywhere about them. These things give relief from the monotony of daily existence on the farm. They make possible many more social engagements. The daily newspaper and the popular magazine help to keep minds alert and so to relieve the strain of daily tasks.

Special mention must be made of the automobile as a new influence in rural life. Its business importance has been enlarged upon in a previous chapter. It is also a great social force; for it brings the diversion that every hard worker needs as a means of keeping up his spirits and vitality. Its effect in stimulating the good roads movement is aiding very much those who cannot afford to own automobiles.

Not the least of the many blessings which the automobile has brought is the pleasure that it has given to the farmers' wives and daughters. Everyone who has thought about rural conditions has seen clearly the need of a better life for the women of our farms. There has undoubtedly been an improvement so far as the household work of the women is concerned: the removal of manufacturing processes from farm to factory has relieved them of many burdens. One often wonders how the women of former days endured the severity of their work. But, indeed, many of them did not endure; they broke down under it. Machinery has helped women's work to some extent. There are sewing and washing machines, better stoves, apple-paring machines, incubators, milk separators, and many smaller labor-saving devices for the

kitchen. But, after all, machinery has not helped household work nearly so much as it has field work. Women have not had their share of the new investments for labor-saving machinery. There are yet too many farms like the one where the farmer runs a harvester drawn by sixteen horses, while the wife carries water in pails from an outside well to the kitchen.

Not only has the life of farm women in the past been overburdened with work and cares, but it has been also more monotonous and isolated than that of the men. They have had less help from the government and other outside agencies than have the men. A committee of Congress has reported as follows: "Our efforts have heretofore been given in aid of the farm man, his horses, cattle, and hogs, but his wife and girls have been neglected almost to the point of criminality." Recognizing these facts, Secretary David F. Houston sent some 55,000 letters to farm women asking them in what ways their life and work could be helped. Many suggestions were made in the replies, but the one most often made was that the kitchen should be supplied with running water.

Besides more conveniences, women in rural life need, and are beginning to have, more opportunities for social improvement and enjoyment. Reading clubs, mothers' clubs, domestic science classes, and other organizations are becoming more common. There is also more social work in connection with the Grange, the Women's Christian Temperance Union, and the local churches.

In "grandfather's time," the country school was the equal, in most respects, of the city school. Both were, indeed, quite primitive; so the young people obtained their real education, aside from that of the "three R's,"

from the work of home and field, rather than from the school. The growth of cities led to the improvement of their schools, while those of the country did not advance, and soon were far behind in the race. Indeed, the rural schools came to have fewer children and less mature teachers. In the newer parts of the country, too, school interests were neglected; for the farmer whose ambition it was to sell out and move on did not take pride in having a good school, and was not willing to pay taxes for it.

In the regions of scattered farms, too, the school was not the center of social life that it had been in former times. The spelling matches, singing schools, and debating clubs were no longer events of the winter months, and "the little red schoolhouse" stood alone and dreary, apparently calling for the least amount of attention and expense that the law allowed.

One reason for this unfortunate condition was the fact that the subjects studied in school by the boys and girls had very little relation to the work and interests of the farm. There was not much beyond the necessary amount of reading, writing, spelling, and arithmetic that everyone must have. And much of the material dealt with in these subjects related to the city, rather than to the country. There were arithmetic problems in banking, stocks, bonds, and insurance, but none in farm accounting. The readers abounded in essays, orations, and stories that led the boy, in imagination, from the field to the factory, the office, and the political platform. There was no study of nature in the country school course, and there was little reference to its beauties or its laws in any subject taught. The history class learned chiefly of wars and politics. How many pupils in country schools realize even yet that

their father's occupation has a history? In brief, it may be said that the subjects dealt with in the old-fashioned country school exaggerated the attractions of city life and thus led the pupils' attention away from the farm. This should be mentioned among the reasons why young people left the farm.

Recent years have brought a change in the country school. It is now believed that there should be a close connection between the school and the daily life of the



A SCHOOL GARDEN

community. Consequently, nature study, domestic science, manual training, and farm accounting are coming into the courses of study. The school helps pupils to carry on such work as that of observing, testing, and experimenting at home. They now have bird houses, museum collections, nature pictures, special day observances, school gardens, debates upon farm topics, and addresses from farmers. In a number of states the teaching of agriculture is compulsory. Agricultural high schools and the preparation of rural school teachers are receiving much attention.

While for several decades the backward condition of country schools has been recognized, their improvement has been very slow. This is partly because of a faulty system of organization. Throughout the North, the schools have been under the "district" system. This was inherited from early New England times. In the old New England town, the "school committee" was com-



A CONSOLIDATED RURAL SCHOOL IN INDIANA

Observe the large number of children in attendance, and the wagons by which they are carried to and from school.

posed of the selectmen (or town board) and the minister. They were men who took an active interest in the work of the school. Gradually, these officers became too much occupied with other duties to attend to all the phases of this work, so they simply managed its business affairs. As the system was carried into the West, with the pioneers, the district contained fewer people, the school was too small, and the teacher was underpaid.

In the West and in the South the country schools have been under the supervision of a county superintendent. The counties are so large that the superintendent can-

not visit the schools frequently enough to observe the work. The best progress has been made where the schools of a town or of a number of districts have been consolidated. Then there can be better paid teachers, better buildings and equipment, and a more active school life in all respects. In many places pupils are transported from their homes to the school each day. This is being done at a lower cost than was necessary to sustain the district schools that have been discontinued.

In many states laws have been passed obliging districts to improve the condition of their schools. Other laws give state aid for improvements and for higher teachers' salaries. Still others have raised the qualifications required of teachers in rural schools.

In former times, the rural teacher was, much more frequently than at present, a man. In those days, the teacher "boarded round" and became an honored guest in one home after another. A deplorable change then came about. Very few men were willing to teach in small country schools; and boarding places for either men or women teachers became hard to find. In fact, the latter are still very often obliged to put up with most wretched accommodations. It is no wonder that the rural teacher longs for a city position; that she stays but a year in a place, and generally gives up teaching entirely after less than three years of service. These are bad conditions for the school and for the children.

One plan that is making rural school teaching more attractive, particularly for married men, is found in the building of a school home for the teacher. Here he may be more independent, may lead a more natural life, and may become attached to his surroundings. In the State

of Washington, more than one hundred such school homes have been built.

The work of boys' and girls' clubs, mentioned in another chapter, is coming to have its natural center in the school. The teacher is the proper person to help organize and direct these activities, and the daily work of the school can be very naturally related to it. All of these forces, together with such helps as travelling libraries and young peoples' reading circles, will lift the rural school to a plane where it will again be as strong and effective as the city school is in its sphere.

Like the school, the rural church also has declined, and for about the same reasons. As population spread, there came to be fewer residents in the average farm community, the people had fewer interests in common, and the farm population became less permanent. In districts that were somewhat thickly settled, the people often built several small churches, for different sects, instead of uniting, as they should have done, to support one strong church. Instead of having a regular minister, many country churches were served only bi-weekly, or less frequently. With fewer church attendants, and fewer services, the social life of the church also became weaker.

There now is an awakening to the evils of these conditions; many men are studying the problem of the country church, and much work of improvement has been begun. Ministers are studying scientific agriculture so that they may take part in the work of farmers' organizations. Courses for their preparation are given in some universities and colleges. Conferences of country ministers are called, for the purpose of discussing country church problems. The Young Men's Christian Association,

which began to plant its organization in Illinois in 1872, now has seventy-five county secretaries engaged in this work in various states.

With the revival of school and church in the country, much will be accomplished to make rural life as attractive as life in the city. There is scarcely any kind of social organization that may not find a place in the country: reading and study clubs, musical clubs, lecture and entertainment courses, dramatic societies, athletic contests, and harvest festivals are perfectly practical and are being introduced in many rural communities. The summer "Chatauqua" has become common in many sections. It takes the place, in some respects, of the old-fashioned "camp meeting." It brings music and entertainment of a high order; and many of the foremost lecturers of the day are secured for its courses. Nebraska, Kansas, and Missouri each have about fifty such courses; Iowa and Illinois each have about two hundred.

One of the strong virtues of the old-time farm life was the place it gave to recreation and play, for both old and young. These are necessary in the life of any healthy person. They are coming back into the farm life of this new era, and are helping to elevate it.

A great obstacle in the way of bringing all these social benefits to rural communities is the spirit of independence that American farmers have shown from the beginning. This spirit is partly a result of their isolated lives. They have looked out for their own personal interests first and most strongly, and have had too little regard for the life of the community. Now, just as the practice of land butchery is being broken down by more intensive scientific agriculture, so the old isolation and narrowness of

farm life must give way to a new spirit that will draw the country folk together for their own social benefit. This can come about through organization under skillful leadership.

Rural communities are being helped to organize themselves by the work of teachers and ministers, and by helpers sent among them from colleges. Recently (1913) the Department of Agriculture has begun to extend help in this direction, through the newly established "Office of Markets and Rural Organization." Prof. T. N. Carver suggests, in connection with this work, that every rural community should have "committees on education, sanitation, recreation, beautification, and household economics, and these committees should be regarded as quite as important as those dealing with business questions." He outlines the work proposed for such committees.¹ All the many things that he mentions can be accomplished when leaders come forward to guide the people in working together for a "more abundant life." Beginnings are being made in all these directions, and they are topics of interest in our agricultural history, but the real work lies in the future.

¹ Year Book of the Department of Agriculture, 1914, pp, 92, 127-128.

CHAPTER XXIX

PROSPERITY AND PROBLEMS

THIRTY years ago this country was in the midst of a period of agricultural depression; those were "hard times" for farmers (see Chapter XIX). Railroads were being built into the West; population was advancing rapidly upon the new, rich soil; crops increased faster than the demand for the products; prices were low and falling lower. Before the year 1900, a new era of prosperity for farmers began, which we still enjoy. The supply of land ready for cultivation approached exhaustion, and immigration poured in from foreign countries; hence population caught up with the production of foods, causing the prices of agricultural products to advance, as is seen from the following table.

YEAR	Corn per bu.	Wheat per bu.	Cotton per lb.	Pork per bbl.	Sugar per lb.	Tobacco per lb.
	<i>cents</i>	<i>dollars</i>	<i>cents</i>	<i>dollars</i>	<i>cents</i>	<i>cents</i>
1895	47	.67	7.44	12.	3.23	8.7
1900	45	.80	9.2	12.5	4.8	8.7
1905	59	1.02	9.8	14.5	4.3	9.
1910	66.8	1.12	15	23.7	4.2	10.8
1914	79	1.09	11.1	22.7	3.8	12.

In the decade 1900-1910, the population of cities increased three times as fast as rural population.

The effect of these new conditions is also seen in the increased value of farm land, which more than doubled in

the same years. In 1900 the average value of a farm was \$3,563. In 1910 this value had increased to \$6,444. These figures include not only the land itself, but also the buildings, machinery, improvements, and stock. Mr. James Wilson, who was Secretary of Agriculture from 1897-1913, called attention to the remarkable agricultural advance of the country during that time. When Mr. Wilson took office, the farm products of each year were worth \$4,000,000,000. When he retired they were worth more than double that amount, \$9,500,000,000 being the figure for 1912. Only a part of this increase is accounted for by larger crops, since there has also been a great increase in the prices of farm products.

Besides increased crops and greater values, many other changes have come about in our agriculture in recent years. Changes in methods have been referred to constantly in these pages. One of the greatest of these is seen in the increased use of mixed farming throughout the West. Where once were seen wheat fields, embracing thousands of acres, there now are seen much smaller fields producing a variety of grains; and these are interspersed with orchards, pastures, and crops of clover and alfalfa. Where once a crop failure meant ruin, we now find the farmers secure from such disaster, because their capital is invested in a dozen crops instead of one. The growth of stock and dairy interests is adding still greater security to intelligent farming.

For those who wish to continue the old methods of extensive farming, with single crops and speculation in land values, the door to western Canada is wide open, and thousands of farmers from the Middle States have gone there. The Canadian government and the railroads

advertise the attractions of the Northwestern wheat lands. The farmer who needs help in getting a start may obtain a loan of money at low rates for a long term. This movement to Canada is but a continuation of that which began at the Atlantic and, rebounding from the arid belt of the Rocky Mountains, was deflected into this fertile region to the north.

Fruit growing is a phase of agriculture that deserves treatment by itself. The spread of this industry has been made possible, not only by scientific discoveries, but also by improvements in transportation and by the use of refrigeration. Refrigeration in the shipment of perishable crops was first tried about the year 1866, the fruit being packed with ice in chests. Soon afterwards the idea of refrigerator cars was worked out, and by 1872 this method had proved successful.

Refrigeration made possible the rapid development of truck farming — one of the remarkable features of recent agriculture. Truck farming on a large scale had its beginnings in the decade between 1840 and 1850, in the region about Norfolk, Virginia. Along the coast from Norfolk south, it is possible to raise some garden crops through the winter. At first, shipments were made to the Northern cities by water, the journey from Norfolk to New York occupying thirty-six hours, and only a few hundred packages being taken by each vessel. In the eighties, all-rail shipments began; carloads of oranges and strawberries were then first brought from districts as far south as Florida.

At present, many special districts in the South have been developed, where particular crops are raised, such as watermelons in Georgia, and sweet potatoes in eastern

Maryland. In addition, all the common vegetables and small fruits are produced in immense quantities throughout the year for Northern markets. Consequently, dwellers in cities and the larger towns may enjoy fresh fruits and vegetables all through the winter months. This means much for the general health of the people.

Extensions and improvements in market gardening have kept pace with those in other special departments of agriculture. The use of glass houses for raising vegetables has been extended to a total of many thousands of acres. The employment of the electric light in greenhouses for the forcing of crops is another remarkable aspect of this work.

With the changes in this great era of prosperity there have come many problems. Some of these are being solved by science and by the use of machinery, as described in previous chapters. Others, like the demand for better credit facilities, and the need for coöperation among farmers, are now under discussion by officials, public bodies, and associations interested in agriculture. Some questions, quite as serious, have not as yet been squarely met and cannot well be solved by the passage of laws.

One of these is the question of tenantry. To-day, more than one-third of our six million farmers rent their farms instead of owning them. In 1880, but one-fourth were tenants; so the number of tenants is increasing faster than the number of farmers. One reason for this condition is found in the great rise of land values within recent years. A laborer now must have considerable capital before he can buy a farm; so he is often obliged to become a tenant, if he would be a farmer at all. In the Middle West, a great many farmers whose lands have be-

come valuable move to town and live upon the income received from renting their farms. Besides, the increase in land values has caused many city dwellers to purchase farms, hoping to sell later at a profit; in the meantime they rent their farms to tenants.

It has always been the pride of America that here anyone who wished could own a farm. This was one of the main inducements that started the tide of immigration to our shores in colonial times; and it has ever since been the attraction that has brought the sturdiest peoples of Europe to become citizens of the great Republic. In contrast with this condition, we have often pointed to the poor tenants of European countries as living under very undesirable conditions. Are we now in danger of seeing much of our agricultural population brought into a state of dependence upon landlords?

Such is the problem. Looking at its brighter side, one may readily see that becoming a tenant, like mortgaging a farm, is often the first step upwards; for it may give the man who has hitherto been a wage-earner the opportunity he needs of acquiring land faster than he could otherwise do it. With the maintenance of free political institutions and a strong social spirit, tenantry may never become with us the evil that it has been in foreign countries.

A more serious problem faces the American farmer to-day — that of the scarcity of labor. This is one reason why many farmers have preferred to rent their farms, and why others have sold out and moved to town. It is not a new problem, for back in colonial times it was impossible to keep farm hands; they went off to get land for themselves, and only those who were in compulsory

service (indentured servants and slaves) could be held for any considerable time.

But in recent years the problem has become more acute. The growth of cities has emphasized the differences between rural and urban life. The farm has come to seem relatively less attractive; the growth of manufactures has enticed laborers from the farms by offers of higher wages. These are not necessarily bad signs, for they may represent the striving of individuals for a higher standard of living.

The conclusion follows that, in order to obtain a supply of the best farm laborers, farmers must offer inducements that equal those of city life. In recent years farm wages have risen; but this is not a complete remedy. Social life on the farm must be made more attractive if the laborers are to be held. The increased use of machinery and the keeping of fine stock call for a type of skilled laborers for farm work. This demand will best be met when homes are provided on farms where married men may live comfortably as hired workers. This is the condition under which workmen prove to be most satisfactory in city employments — why not on the farm?

Farmers have helped to solve the problem of efficient laborers when they have banished the saloon from their communities. This has been done throughout a large portion of the country during recent years. The prohibition movement results not only in improving moral conditions; it is also a simple business proposition of saving that which was previously wasted. It is a step toward efficiency similar to that which is taking place in many other employments. Neither the manager nor the worker in any serious business enterprise can afford to

lessen his capacity by habits that undermine his physical or moral strength. Says the Country Life Commission (Report, p. 44), "The saloon is an institution that should be banished from at least all country districts and rural towns, if our agricultural interests are to develop to the extent to which they are capable."

But prohibition is only the first step toward reform. There should be brought into rural life other social opportunities that will take the place of those offered by the saloon.

Another remedy for the scarcity of farm laborers has been sought in the employment of immigrants fresh from foreign countries. Many people of certain nationalities — Greeks, Poles, Italians, and Portuguese — seem to prefer living in cities. At the same time they can be hired in large numbers to work during a part of the summer upon certain crops. They become berry pickers, or work in market gardens, or in sugar beet fields. As farm laborers for steady employment, newly arrived immigrants are not very satisfactory, on the whole. They are ignorant of American ways and often require much instruction and guidance.

On the other hand, there are in the United States many farm communities composed of foreign-born peoples who have bought land. The story of these foreign agricultural groups would make a book in itself. Their members — Swiss, Bohemians, Germans, Scandinavians, Poles, Icelanders, Italians, and others — have, like the first colonists of the Atlantic coast, striven in poverty and against adverse circumstances to found their homes. They have progressed; their children have become thorough Americans, and have often risen to places of honor in their native states or in the service of their country.

At no time in our history has there been such interest in the study of agricultural problems as there is at present. Not only the colleges and the agricultural periodicals, but business men's associations and newspapers and magazines of all kinds are dealing with these questions. Numerous "conferences" have been held for their discussion in various states. As a result, several state country life commissions have been established to study further all questions connected with farm life.

The conviction is now widespread that farmers can best work according to scientific methods when they have the direct assistance of *experts*. Hence, plans have been made for placing an agricultural expert in every county of the United States. A prominent mercantile firm has offered to contribute one thousand dollars to each of one thousand counties, provided the latter will raise an equal amount.

In December, 1913, the Committee on Agriculture of the House of Representatives offered a plan for the granting of government aid to this movement. The outcome was the passage of the Smith-Lever act of May, 1914. Under this law, Congress is to appropriate \$10,000 annually to each state, or a total of \$480,000. In addition to this, appropriations are to be made as follows: \$600,000 the second year, this amount to be *increased* by \$500,000 each year for seven years. These added appropriations are to be made upon the condition that each state makes appropriations of similar amounts. At the end of the seven years the total annual appropriation by Congress, if all the states respond in the amounts expected, will be \$4,580,000. So the total amount of money available each year from these sources will be \$9,160,000.

For what is this vast sum to be used? The plans made for its expenditure involve in the main a continuation and extension of the farm demonstration work already under way in the South, as described on pages 319-322. They involve the placing in every one of the 3,000 counties of the country an expert to act as general advisor for the farmers, and actually to show them on their own lands what scientific farming will accomplish. The expert will also conduct experiments and contests, and will assist the farmers in the difficult business of farm management. Besides, they are expected to stimulate the social side of farm life; to organize clubs, conduct meetings, and supervise the study of agriculture in the schools. Here is a vision of wonderful things to be accomplished. This law may mark an epoch in the history of American agriculture.

A sign that is even more hopeful for the future of good farming in America is the movement that has been already described for the organization of boys' and girls' clubs. This movement has extended throughout the land; the clubs are said to include 250,000 members. In this way boys and girls are being educated to become farm workers who will need little expert guidance. They are being taught to observe, as the basis of all scientific knowledge; they are learning the value of coöperation in agriculture; they are becoming intelligent students of all the problems that face the farmers of to-day, and that must be solved by the farmers of to-morrow.

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